
SEMINOLE COUNTY GOVERNMENT AGENDA MEMORANDUM

SUBJECT: Construction Contract: CC-2059-07/LKR Markham Woods Road Utilities Phase II

DEPARTMENT: Administrative Services

DIVISION: Purchasing and Contracts

AUTHORIZED BY: Frank Raymond

CONTACT: Lisa Riner

EXT: 7113

MOTION/RECOMMENDATION:

Award CC-2059-07/LKR in the amount of \$3,910,167.70 to Expertech Network Installation, Inc. of Plantation, Florida, for all labor, materials, equipment, transportation, coordination and incidentals necessary for the construction of Markham Woods Road Utilities Phase II.

County-wide

Ray Hooper

BACKGROUND:

CC-2059-07/LKR will provide for all labor, materials, equipment, transportation, coordination and incidentals necessary for the construction of approximately 7,300 linear feet of water main ranging from 6 inches to 12 inches in diameter, approximately 12,830 linear feet of reclaimed water ranging from 4 inches to 24 inches, and approximately 12,000 feet of 12-inch PVC sanitary force main. In addition, project scope will include 12,450 linear feet of 2-inch fiber optic cable, pull rope boxes, fittings, valves, miscellaneous appurtenances, testing, site restoration, clean-up, and any incidentals necessary to provide a complete and working installation, ready for operation. The Contractor shall perform installation by means of open cut construction methods.

The project was publicly advertised and the County received seven (7) bids, of which five (5) bids were determined to be responsive. The Review Committee, consisting of Dennis Westrick, PEI Manager; Carol Hunter, Principal Engineer; Brad Stroppel, Senior Engineer; and Mike Harber, Senior Engineer, all from Environmental Services, reviewed the responses. Consideration was given to bid price, experience, qualifications and the results of reference checks.

The Review Committee recommends award of the contract to the lowest priced, responsive, responsible bidder, Expertech Network Installation, Inc. of Plantation, Florida, in the amount of \$3,910,167.70. The completion time for this project is three hundred fifty-four (354) calendar days from issuance of the Notice to Proceed by the County. The attached backup documentation includes the Bid Tabulation.

This is a budgeted project and funds are available in the account line Water and Sewer Bonds, Series 20 - WS/Markham Woods Road Reclaimed (40105.169100, CIP #00182301) and Connection Fees/Water - Markham Woods Road Water Main (40102.169100, CIP #00193101).

STAFF RECOMMENDATION:

Staff recommends the Board award CC-2059-07/LKR in the amount of \$3,910,167.70 to Expertech Network Installation, Inc. of Plantation, Florida, for all labor, materials, equipment, transportation, coordination and incidentals necessary for the construction of Markham Woods Road Utilities Phase II.

ATTACHMENTS:

1. CC-2059-07/LKR Agenda Backup
2. CC-2059-07/LKR Award Agreement to Expertech Network Installation Inc

Additionally Reviewed By:

☒ County Attorney Review (Ann Colby)

B.C.C. - SEMINOLE COUNTY, FL BID TABULATION SHEET

ALL BIDS ACCEPTED BY SEMINOLE COUNTY ARE SUBJECT TO THE COUNTY'S TERMS AND CONDITIONS AND ANY AND ALL ADDITIONAL TERMS AND CONDITIONS SUBMITTED BY THE BIDDERS ARE REJECTED AND SHALL HAVE NO FORCE AND EFFECT. BID DOCUMENTS FROM THE VENDORS LISTED HEREIN ARE THE ONLY BIDS RECEIVED TIMELY AS OF THE ABOVE OPENING DATE AND TIME. ALL OTHER BID DOCUMENTS SUBMITTED IN RESPONSE TO THIS SOLICITATION, IF ANY, ARE HEREBY REJECTED AS LATE.

BID NUMBER: **CC-2059-07/LKR**
 PROJECT TITLE: Markham Woods Road Utilities Ph II
 BID DUE DATE: July 25, 2007 at 2:00 P.M. Eastern

QUALIFICATION
 OPENING DATE: July 26, 2007 at 10:00 A.M Eastern

BID OPENING
 DATE: July 27, 2007 at 2:00 P.M. Eastern

PAGE: 1 of 2

ITEM DESCRIPTION	Response #1	Response #2	Response #3	Response #4
	AJC Construction, LLC 8046A Presidents Drive Orlando, FL 32809 Alexander Caputo 407-855-5572 (Phone) 407-855-4922 (Fax)	Akerman Construction Co, Inc. 2915 State Hwy 74 South Purcell, OK 73080 Steve Akerman 405-527-1232 (Phone) 405-527-0192 (Fax)	American Persian Engineers & Constructors, Inc. 4436 Old Winter Garden Rd. Orlando, FL 32811 Majid Fouladi 407-522-0530 (Phone) 407-532-8332 (Fax)	Danella National, Inc. 1001 W. Cypress Creek Rd. Suite 300 Ft. Lauderdale, FL 33309 Tom Bass 954-691-1720 (Phone) 954-691-1719 (Fax)
TOTAL AMOUNT OF BID	\$5,762,000.00	\$5,360,061.00	\$4,980,945.00	\$4,474,684.50
Acknowledge addenda 1-7			Yes	Yes
Bid bond			Yes	Yes
Trench Safety Act			Yes	Yes
Bidder Information Form			Yes	Yes
Non-Collusion Affidavit			Yes	Yes
Drug-Free Workplace Form			Yes	Yes
American w/Disabilities Act			Yes	Yes
Qualification Review			Satisfactory	Satisfactory

Non-responsive

Non-responsive

B.C.C. - SEMINOLE COUNTY, FL BID TABULATION SHEET

BID NUMBER: **CC-2059-07/LKR**

PAGE: 2 of 2

ITEM DESCRIPTION	Response #5	Response #6	Response #7
	Expertech Network Installation, Inc. 6781 West Sunrise Blvd Plantation, FL 33313 David Marinelli 954-797-4364 (Phone) 954-797-6851 (Fax)	John Carlo, Inc. 9671 Tradeport Dr. Orlando, FL 32827 Curtis A. Johnson 407-816-3503 (Phone) 407-816-3505 (Fax)	Stately Contractors, Inc. 6028 33 rd St. East Bradenton, FL 34203 Glenn P. Bower 941-756-4700 941-756-4540
TOTAL AMOUNT OF BID	\$3,910,167.70	\$4,566,681.00	\$4,002,520.00
Acknowledge addenda 1-7	Yes	Yes	Yes
Bid bond	Yes	Yes	Yes
Trench Safety Act	Yes	Yes	Yes
Bidder Information Form	Yes	Yes	Yes
Non-Collusion Affidavit	Yes	Yes	Yes
Drug-Free Workplace	Yes	Yes	Yes
American w/Disabilities Act	Yes	Yes	Yes
Qualification Review	Satisfactory	Satisfactory	Satisfactory

Packages were received for this Bid under a two-envelope process, as stated within Instructions to Bidders Section 14 (p. 00010-6) and Supplemental Conditions Section 3 (p. 00900).

Bid Due Date Tabulated by Diane Reed, Senior Procurement Analyst

(Posted by Diane Reed on July 25, 2007 at 4:15 p.m. Eastern)

Qualifications Review Meeting: July 26, 2007 at 10:00 a.m., Environmental Services Small Conference Room, 500 W. Lake Mary Blvd, Sanford, FL 32773

(Posted by Diane Reed on July 25, 2007 at 4:15 p.m. Eastern)

Qualification Opening Tabulated by Diane Reed, Senior Procurement Analyst

(Posted by Diane Reed on July 25, 2007 at 4:15 p.m. Eastern)

Bid Package Opening: July 27, 2007 at 2:00 p.m., Purchasing and Contracts Conference Room 3223, 1101 E. First St, Sanford, FL 32771

(Posted by Diane Reed on July 25, 2007 at 4:15 p.m. Eastern)

Bid Opening Tabulated by Lisa Riner, Senior Procurement Analyst

(Posted by Robert Hunter on July 27, 2007 at 5:00 p.m. Eastern)

(Revised and Posted by Lisa Riner on July 30, 2007 at 11:10 a.m. Eastern)

Recommendation of Award: Expertech Network Installation, Inc.

BCC Agenda Date: September 25, 2007

CONSTRUCTION SERVICES AGREEMENT (CC-2059-07/LKR)
MARKHAM WOODS ROAD UTILITIES PHASE II

THIS AGREEMENT is dated as of the ____ day of _____ 2007, by and between **EXPERTECH NETWORK INSTALLATION, INC.**, duly authorized to conduct business in the State of Florida, whose address is 6781 W. Sunrise Boulevard, Plantation, Florida 33313, hereinafter called "CONTRACTOR", and **SEMINOLE COUNTY**, a political subdivision of the State of Florida, whose address is Seminole County Services Building, 1101 East First Street, Sanford, Florida 32771, hereinafter called "COUNTY". COUNTY and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

W I T N E S S E T H:

SECTION 1. WORK. CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as Markham Woods Road Utilities Phase II.

The Project for which the Work under the Contract Documents is a part is generally described as Markham Woods Road Utilities Phase II.

SECTION 2. ENGINEER.


(a) ENGINEER OF RECORD as named in the Contract Documents shall mean INWOOD ENGINEERING CONSULTANTS, whose address is 870 Clark Street, Oviedo, Florida 32765.

(b) "CEI" is COUNTY's contracted Consultant for construction, engineering and inspection ("CEI") services. As named in the Contract Documents, "CEI" shall mean CH2M HILL, whose address is 510 West Lake Mary Boulevard, Sanford, Florida 32773.

SECTION 3. CONTRACT TIME.

(a) All provisions regarding Contract Time are essential to the performance of this Agreement.

(b) The Work shall be substantially completed as described in subsection 14.13 of the General Conditions, within three hundred twenty-four (324) calendar days after the date when the Contract Time begins to run as provided in subsection 2.2 of the General Conditions. The Work shall be finally completed, ready for Final Payment in accordance with subsection 14.9 of the General Conditions, within thirty (30) calendar days after the actual date of Substantial Completion.

(c) The parties acknowledge that the Contract Time provided in this Section includes consideration of adverse weather conditions common to Central Florida including  the possibility of hurricanes and tropical storms.

(d) The Contract Time provided in this Section includes thirty (30) days allocated specifically to CONTRACTOR's responsibility for utility coordination or relocation of utilities at or adjacent to the Project site. The thirty (30) days shall be depicted by CONTRACTOR as float time not impacting Controlling Work Items on CONTRACTOR's critical path scheduling. No Contract Time extensions shall be considered related to utility coordination matters including, but not limited to, utility relocations and conflicts unless the utility related time impacts exceed thirty (30) Days impact on Controlling Items of Work in accordance with the Project Schedule.

(e) In the event that the Work requires phased construction,

then multiple points of Substantial Completion may be established in the Supplementary Conditions.

SECTION 4. CONTRACT PRICE.

(a) COUNTY shall pay CONTRACTOR for performance of the Work in accordance with the Contract Documents on the basis of the Total Bid (original Contract Price). CONTRACTOR's total compensation is THREE MILLION NINE HUNDRED TEN THOUSAND ONE HUNDRED SIXTY-SEVEN AND 70/100 DOLLARS (\$3,910,167.70) subject only to increases or decreases made in strict conformance with the Contract Documents.

(b) CONTRACTOR agrees to accept the Contract Price as full compensation for doing all Work, furnishing all Materials, and performing all Work embraced in the Contract Documents; for all loss or damage arising out of performance of the Work and from the action of the elements or from any unforeseen or unknown difficulties or obstructions which may arise or be encountered in the prosecution of the Work until the Final Acceptance; and for all risks of every description connected with the Work.

(c) CONTRACTOR acknowledges that CONTRACTOR studied, considered, and included in CONTRACTOR's Total Bid (original Contract Price) all costs of any nature relating to: (1) performance of the Work under Central Florida weather conditions; (2) applicable law, licensing, and permitting requirements; (3) the Project site conditions, including but not limited to, subsurface site conditions; (4) the terms and conditions of the Contract Documents, including, but not limited to, the indemnification and no damage for delay provisions of the Contract Documents.

(d) CONTRACTOR acknowledges that performance of the Work will involve significant Work adjacent to, above, and in close proximity to Underground Facilities including utilities which will require the support of active utilities, as well as, the scheduling and sequencing of utility installations and relocations (temporary and permanent) by CONTRACTOR.

(1) In addition to the acknowledgments previously made, CONTRACTOR acknowledges that CONTRACTOR's Total Bid (original Contract Price) specifically considered and relied upon CONTRACTOR's own study of Underground Facilities, utilities in their present, relocated (temporary and permanent) and proposed locations, and conflicts relating to utilities and Underground Facilities.

(2) CONTRACTOR acknowledges that CONTRACTOR's Total Bid (original Contract Price) considered and included all of CONTRACTOR's costs relating to its responsibilities to coordinate and sequence the Work of CONTRACTOR with the work of COUNTY with its own forces, the work of other utility contractors, and the work of others at the Project site.

SECTION 5. PAYMENT PROCEDURES.


(a) Application for Payment. CONTRACTOR shall submit Applications for Payment in accordance with Section 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

(b) Progress Payments. COUNTY shall make progress payments on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, in accordance with Section 14 of the General Conditions.

(c) Final Payment. Upon Final Completion and acceptance of the Work in accordance with subsection 14.9.1 of the General Conditions, COUNTY shall pay the remainder of the Contract Price as provided in subsection 14.9.1.

SECTION 6. ADDITIONAL RETAINAGE FOR FAILURE TO MAINTAIN PROGRESS ON THE WORK.


(a) Retainage under the Contract Documents is held as collateral security to secure completion of the Work.

(b) In the event that CONTRACTOR fails to physically mobilize to the Work site as required by Section 6.19 of the General Conditions, COUNTY may withhold additional retainage to secure completion of the Work in an amount equal to the product of the number of days after the 31st day following the Date of Commencement of Contract Time and the liquidated  damage amount for Substantial Completion set forth in Section 9 of this Agreement. The additional retainage will be withheld from the initial and each subsequent Progress Payment. The additional retainage held under this subsection will be released to CONTRACTOR in the next Progress Payment following the ENGINEER's approval of a supplementary Progress Schedule demonstrating that the requisite progress will be regained and maintained as required by Section 6.19.2 of the General Conditions.

(c) If CONTRACTOR is behind schedule and it is anticipated by COUNTY that the Work will not be completed within the Contract Time, COUNTY may withhold additional retainage in anticipation of liquidated damages equal to the product of the number of days after the scheduled Contract Time (Substantial Completion or Final Completion) and the

amount of liquidated damages set forth in Section 9 of this Agreement. The additional retainage under this subsection may, at COUNTY's discretion, be withheld from subsequent Progress Payments. Any additional retainage held under this subsection shall be released to CONTRACTOR in the next Progress Payment following the ENGINEER's approval of a supplemental Progress Schedule demonstrating that the requisite progress will be regained and maintained as required by Section 6.19.2 of the General Conditions.

SECTION 7. CONTRACTOR'S REPRESENTATIONS. In order to induce COUNTY to enter into this Agreement, CONTRACTOR makes the following representations:

(a) CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work, locality, and weather; utility locations; all local conditions;  Chapter 220, Part 1, "Purchasing Code", Seminole County Code; federal, state, and local laws; and ordinances, rules, policies, and regulations that in any manner may affect cost, progress, or performance of the Work.

(b) CONTRACTOR has studied carefully and considered in its Bid all reports of investigations and tests of subsurface and physical conditions of the site affecting cost, progress, scheduling, or performance of the Work.

(c) CONTRACTOR has studied carefully and considered in its Bid the Plans and Specifications, performed necessary observations and examinations, and studied the physical conditions at the site related to Underground Facilities, utility installations, conflicts, relocations (temporary and permanent), and all other Underground

Facilities and utility related conditions of the Work and site that may affect cost, progress, scheduling, or any aspect of performance of the Work and that its Bid reflects all such conditions. CONTRACTOR, by submitting its Bid and executing this Agreement, acknowledges the constructability of the Work under the Plans and Specifications. CONTRACTOR, by its study, excludes and releases COUNTY from any implied warranties, including but not limited to, the "Spearin Doctrine", and acknowledges that the Plans and Specifications are adequate to perform the Work.

(d) CONTRACTOR has made or caused to be made examinations, investigations, tests, and studies as it deems necessary for the performance of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports, or similar data are or will be required by CONTRACTOR for such purposes.


(e) CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the terms and conditions of the Contract Documents.

(f) CONTRACTOR has given ENGINEER written notice of all conflicts, errors, or discrepancies that it has discovered in the Contract Documents; and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.


(g) CONTRACTOR declares and agrees that the approval or acceptance of any part of the Work or Material by COUNTY, ENGINEER, or any agent relating to compliance with the Contract Documents shall not

operate as a waiver by COUNTY of strict compliance with the terms and conditions of the Contract Documents.

(h) CONTRACTOR declares and agrees that COUNTY may require him to repair, replace, restore, or make all things comply with the Contract Documents including all Work or Materials which within a period of two (2) years from Acceptance by COUNTY are found to be defective or fail in any way to comply with the Contract Documents. CONTRACTOR acknowledges that the above two (2) year repair, replace, and restoration period is separate from and additional to CONTRACTOR's warranty that the Work has been completed in compliance with the Contract Documents. The two (2) year repair, replace, and restoration period is not a limitation upon CONTRACTOR's other warranties or Material and Workmanship Bond.

(i) CONTRACTOR's resident  Superintendent at the Work site shall be **KASEY RIDER**, and this Superintendent only shall be utilized by CONTRACTOR unless otherwise approved by COUNTY Project Manager after following the procedure indicated in the General Conditions.

(j) CONTRACTOR has studied carefully and considered all permit requirements related to performance of the Work. CONTRACTOR declares and agrees that all costs related to performing the Work in compliance with the requirements of all permits at the Contract Price are included in the Contract Price. CONTRACTOR agrees that it shall be solely responsible for payment of all fines and penalties of any nature assessed to CONTRACTOR, COUNTY, or both by any governmental entity, district, or authority, or other jurisdictional entity, relating to all permits required for performance of the Work.


(k) CONTRACTOR acknowledges that the performance of the Work under the Contract Documents fulfills a COUNTY, CONTRACTOR and public purpose. To that end, CONTRACTOR agrees to respond to citizen complaints, related to alleged damage caused by CONTRACTOR's performance of the Work, within ten (10) days of receipt of the complaint from any citizen, ENGINEER, or COUNTY. CONTRACTOR shall utilize the attached "Report of Unsatisfactory Materials and/or Service" form to respond separately to each complaint. When a complaint is brought to CONTRACTOR by a citizen, CONTRACTOR shall identify the citizen and street address in the "Statement of Problem". Responses and action taken by CONTRACTOR shall specifically identify the problem and specific actions taken. Generic statements such as "addressed the problem" are unacceptable. If CONTRACTOR fails to respond within ten (10) days,  COUNTY may take corrective action and deduct the actual costs of corrective action from subsequent Progress Payments or the retainage.

(l) CONTRACTOR acknowledges that county-owned property obtained for performance of the Work within the project limits includes temporary construction easements. In the event that CONTRACTOR fails to perform the Work within the Contract Time, then CONTRACTOR shall be solely responsible for payment of all costs for additional or extended temporary construction easements. CONTRACTOR authorizes COUNTY to deduct the actual costs of additional or extended temporary construction easements from subsequent Progress Payments or the retainage.

SECTION 8. CONTRACT DOCUMENTS. (a) The Contract Documents which comprise the entire agreement between COUNTY and CONTRACTOR are made a part hereof and consist of the following, in order of precedence:

- (1) This Agreement;
- (2) Bid Form and Addenda Acknowledgment, attached hereto as Exhibit B;
- (3) Trench Safety Act, attached hereto as Exhibit C; and
- (4) American with Disabilities Act Affidavit, attached hereto as Exhibit D;

(b) As the Project progresses, additional documents shall become part of the Agreement between COUNTY and CONTRACTOR. These documents are:

- (1) Performance Bond 
- (2) Payment Bond;
- (3) Material and Workmanship Bond;
- (4) Specifications;
- (5) Technical Specifications Provided in these Contract Documents;
- (6) General Conditions;
- (7) Supplementary Conditions including any utility-specific forms provided by County's Utility Division;
- (8) Notice to Proceed;
- (9) Change Orders;
- (10) Certificate of Substantial Completion;
- (11) Certificate of Final Inspection;

(12) Certificate of Engineer;
(13) Certificate of Final Completion;
(14) Contractor's Release;
(15) Drawings and Plans;
(16) Supplemental Agreements;
(17) Contractor's Waiver of Lien (Partial);
(18) Contractor's Waiver of Lien (Final and Complete);
(19) Subcontractor/Vendor's Waiver of Lien (Final and Complete);
(20) Consent of Surety to Final Payment;
(21) Instructions to Bidders; and
(22) Contractor's Insurance Requirements, Certificate, and Insurance Policies.

(c) There are no Contract Documents other than those listed above in this Section 8. The Contract Documents may only be altered, amended, or repealed by a modification as provided in the General Conditions.

SECTION 9. LIQUIDATED DAMAGES.

(a) COUNTY and CONTRACTOR recognize that time is essential to the performance of this Agreement, and CONTRACTOR recognizes that COUNTY and its traveling public will suffer financial loss if the Work is not substantially completed as described in subsection 14.13 of the General Conditions within the time specified below, plus any extensions thereof allowed in accordance with Section 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or alternative dispute

resolution proceeding the damages resulting from inconvenience to the traveling public including traffic loading, intersection operations, costs for time, costs of fuel, and costs for some environmental impacts (excluding actual delay damages which may include, but are not limited to, engineering fees and inspection costs) suffered by COUNTY if the Work is not completed on time. Accordingly, CONTRACTOR and CONTRACTOR's Surety agree to pay COUNTY as liquidated damages, and not as a penalty, TWO THOUSAND SIX HUNDRED AND NO/100 DOLLARS (\$2,600.00) per day for each day CONTRACTOR exceeds the Contract Time for Substantial Completion until the Work is Substantially Complete. It is agreed that if this Work is not Finally Completed in accordance with the Contract Documents, CONTRACTOR shall pay COUNTY as liquidated damages for delay, and not as a penalty, one-fourth (1/4) of the rate set forth above.




(b) CONTRACTOR shall pay or reimburse, in addition to the liquidated damages specified herein, COUNTY's actual damages which may include, but are not limited to, expenses for engineering fees and inspection costs arising from CONTRACTOR's failure in meeting either or both the Substantial Completion and Final Completion dates.

(c) The liquidated damages provided in this Section are intended to apply even if CONTRACTOR is terminated, in default, or if CONTRACTOR has abandoned the Work.

SECTION 10. MISCELLANEOUS.

(a) Terms used in this Agreement which are defined in Section 1 of the General Conditions shall have the meanings indicated in the General Conditions.

(b) No assignments by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound, and any such assignment shall be void and of no effect. Specifically, but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

(c) COUNTY and CONTRACTOR each binds itself and its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants,  agreements, and obligations contained in the Contract Documents.

SECTION 11. CONTRACTOR'S SPECIFIC CONSIDERATION. In consideration of CONTRACTOR's indemnity agreements as set out in the Contract Documents, COUNTY specifically agrees to pay CONTRACTOR the sum of TWO HUNDRED FIFTY AND NO/100 DOLLARS (\$250.00). CONTRACTOR acknowledges receipt of the specific consideration for CONTRACTOR's indemnification of COUNTY and that the specific consideration is included in the original Contract Price allocated by CONTRACTOR among all pay items, receipt of which is hereby acknowledged.

SECTION 12. NOTICES. Whenever either party desires to give notice unto the other including, but not limited to, Contract Claims, it must be given by written notice, hand delivered, signed and dated for

receipt, or be sent by certified United States mail, return receipt requested, addressed to the party for whom it is intended at the place last specified. The place for giving of notice shall remain such until it has been changed by written notice in compliance with the provisions of this Section. For the present, the parties designate the following as the respective places for giving of notice, to wit:


For COUNTY:

Environmental Services
500 W. Lake Mary Blvd.
Sanford, FL 32771

For CONTRACTOR:

Expertech Network Installation, Inc.
6781 West Sunrise
Plantation, FL 33313

SECTION 13. CONFLICT OF INTEREST.

(a) CONTRACTOR agrees that  it will not engage in any action that would create a conflict of interest in the performance of its obligations pursuant to this Agreement with COUNTY or which would violate or cause others to violate the provisions of Part III, Chapter 112, Florida Statutes, relating to ethics in government. (See County Personnel Policy 4.10(F).)


(b) CONTRACTOR hereby certifies that no officer, agent or employee of COUNTY has any material interest (as defined in Section 112.312 (15), Florida Statutes, as over 5 percent) either directly or indirectly, in the business of CONTRACTOR to be conducted here and that no such person shall have any such interest at any time during the term of this Agreement.

(c) Pursuant to Section 216.347, Florida Statutes, CONTRACTOR

hereby agrees that monies received from COUNTY pursuant to this Agreement will not be used for the purpose of lobbying the legislature or any other state or federal agency.

SECTION 14. MATERIAL BREACHES OF AGREEMENT.

(a) The parties recognize that breaches of the Contract Documents may occur and that remedies for those breaches may be pursued under the Contract Documents. The parties further recognize that the safety of the traveling public is of paramount concern. Therefore, the parties agree that any breach of the Contract Documents related to life safety, including but not limited to, the maintenance of traffic requirements of the Contract Documents, shall be considered a breach of the Contract Documents.

(b) Upon a material breach of the Contract Documents related to life safety as determined by ENGINEER  the ENGINEER shall issue a Stop Work Order suspending the Work or any specific portion of the Work until the conditions are corrected. If the life safety conditions giving rise to the Stop Work Order are not corrected within a reasonable time, as determined by ENGINEER, then the material breach shall entitle COUNTY to terminate this Agreement. The recognition of breaches of the provisions of the Contract Documents related to life safety as material breaches shall not be construed as a limitation on other remedies for breaches or material breaches of the Contract Documents.

(End of Agreement - Signature Page Follows)

IN WITNESS WHEREOF, the parties hereto have executed this Agreement. All portions of the Contract Documents have been signed or identified by COUNTY and CONTRACTOR or by ENGINEER on their behalf.

ATTEST: EXPERTECH NETWORK INSTALLATION, INC.

_____, Secretary By: _____, President
(CORPORATE SEAL) Date: _____

ATTEST: BOARD OF COUNTY COMMISSIONERS
SEMINOLE COUNTY, FLORIDA

MARYANNE MORSE By: _____
Clerk to the Board of CARLTON HENLEY, Chairman
County Commissioners of
Seminole County, Florida.

For the use and reliance of Seminole County only. Date: _____

Approved as to form and legal sufficiency. As authorized for execution by the Board of County Commissioners at their _____, 2007, regular meeting.

County Attorney

AEC:jjr
09/04/2007
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EXHIBIT A
TECHNICAL SPECIFICATIONS

MARKHAM WOODS ROAD UTILITIES-PHASE 2
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5/22/06

SECTION 01000-SPECIAL PROCEDURES FOR SEMINOLE COUNTY UTILITIES

These Special Procedures amend or supplement the General Conditions of the Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

1. It is recommended that CONTRACTOR attends a Pre-Bid Conference.
2. For projects administered primarily by the Utilities Division, the COUNTY shall provide written notification to the Apparent Low Bidder indicating that they are the Apparent Low Bidder and the COUNTY shall then commence negotiations with this entity.

In addition to Chapter 220, Seminole County Code requirements, the COUNTY shall receive from the Apparent Low Bidder (or the Low Bidder), within ten days after receipt of written notification by COUNTY, a list of all Subcontractors and other persons and organizations, including those who are to furnish the principal items of Material and Equipment. This list shall include the name and address of the Subcontractor, person or organization, a description of the services, Materials or Equipment to be supplied, estimated time required for the preparation and submittal of shop drawings, and estimated lead times required for the fabrication of any long lead items and concurrence thereof. Such list shall be accompanied by a statement of experience with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, person or organization. If COUNTY or ENGINEER has reasonable objection to any proposed Subcontractor, other person or organization, either may, before the Notice of Award, request the Apparent Low Bidder (or the Low Bidder) to submit an acceptable substitute without an increase in the Total Bid. If the Apparent Low Bidder (or the Low Bidder) declines to make any such substitution, the Agreement may not be awarded to such Bidder at the COUNTY's sole discretion, but his declining to make any such substitution may not constitute grounds for sacrificing his Bid Security. Any Subcontractor, other person or organization so listed and to whom COUNTY or ENGINEER does not make written objection prior to the Notice of Award will be deemed acceptable to COUNTY and ENGINEER, but COUNTY and ENGINEER do not thereby waive any right they may have against the CONTRACTOR because of the actions or omissions of Subcontractor, other person or organization.

3. For projects administered primarily by the Utilities Division, a pre-award conference is required by Seminole County Utilities. The COUNTY will require a conference with the Apparent Low Bidder to assure a full and complete understanding of the obligations of the CONTRACTOR under a resulting contract. At the pre-award conference the Apparent Low Bidder shall have been given the opportunity to have acquired data and shall submit in such form as to reasonably demonstrate that the

CONTRACTOR's understanding of the Scope of Work conform to the contract requirements. The failure of the Low Bidder to substantiate conformance to the contract requirements shall be cause for the rejection of the low bid. All bidders are requested to discuss the potential for a pre-award conference at the pre-bid conference which together shall serve as the basis for resolution of ambiguities and the potential for disputes prior to award or during the administrative phase of the contract. Seminole County believes that these additional measures shall assist all bidders on bidding on a free, open and competitive basis with all bidders fully understanding the nature of the work to be performed under the resulting contract.

It shall be the responsibility of the Apparent Low Bidder to attend a pre-award meeting with the COUNTY within 14 days of receiving written notification from the COUNTY indicating that the entity is the Apparent Low Bidder. Should the Apparent Low Bidder fail to respond within the given time frame, the COUNTY may commence negotiations with the next Apparent Low Bidder. This does not waive the COUNTY's right to seek a claim against the Apparent Low Bidder and bid bond agency for the incremental differential cost between the Apparent Low Bidder and the selected CONTRACTOR.

4. For construction projects that are either: (1) primarily roadway projects that include Seminole County utilities within the project boundary or (2) primarily utility projects requiring installation of water and sewer mains on behalf of Seminole County Utilities; then prior to the issuance of a Notice to Proceed, a preconstruction conference to address issues specific to the Seminole County utilities Division shall be attended by the CONTRACTOR and his subcontractors, ENGINEER and COUNTY and other entities as applicable to the project at which time a date will be established for the issuance of the Notice to Proceed. For projects administered primarily by the Utilities Division, then after the preconstruction conference, the Notice to Proceed shall be sent by the COUNTY and received by the CONTRACTOR for execution no later than five (5) calendar days prior to the date listed on the Notice to Proceed. The CONTRACTOR shall return the executed Notice to Proceed to the COUNTY by the date indicated on the Notice to Proceed. The failure of the CONTRACTOR to comply with this provision will not change the contract time calculated by the COUNTY and the COUNTY will recognize the dates listed on the Notice to Proceed as the actual date of Commencement of Construction.
5. For projects administered primarily by the Utilities Division, the Agreement will be awarded only to a Bidder performing at least ~~fifty~~ percent ~~(50%)~~ of the total work, as measured by cost, within his own organization not including material costs unless otherwise provided in Specifications. The COUNTY may declare any Bidder ineligible at any time during the process of receiving Bids or awarding the Agreement where developments arise which, in the opinion of the COUNTY, adversely affect the Bidder's responsibility.
6. For projects administered primarily by the Utilities Division, it shall be the responsibility of the CONTRACTOR to begin to physically mobilize at the project

site within 14 days of the issuance of the Notice to Proceed and substantially complete mobilization activities no later than 30 days from the Notice to Proceed. Substantial Completion for mobilization shall be defined as activities that include, but are not limited to (1) installation of field office, (2) temporary utility provisions for water, sewer, electrical, telephone, and other utilities in service, and (3) commence initial site preparation in the form of clearing and grubbing activities, or blasting and removal, or other work as required prior to the actual Commencement of Construction. Should the CONTRACTOR fail to respond within the given time frame, the COUNTY shall commence accumulation of liquidated damages in the amount of \$ 500.00 /day beginning on the 31st day from the Notice to Proceed.

7. For projects administered primarily by the Utilities Division, no work shall be performed by any subcontractors without the CONTRACTOR or his designated representative physically present on the construction job site.
8. The Seminole County Utilities Division emergency telephone number is (407) 665-2767 (all hours).
9. The CONTRACTOR shall prepare and submit to the COUNTY through the ENGINEER the following forms as required throughout the duration of the project:
 - (a) 72 Hour Request for System Shut Down;
 - (b) Jumper Connection Form associated with Certification of Clearance for Water Service Form;
 - (c) 7-Day Request for Vendor or Manufacturer's Training;
 - (d) Request for Temporary Construction Meter;
 - (e) Inspection Check List;
 - (f) Seminole County Water Clearance Procedure;
 - (g) Project Acceptance Check List.
10. The CONTRACTOR shall follow all procedures as outlined on the forms mentioned above and included with this section entitled "Special Procedures for Seminole County Utilities." No specific pay item is associated with these items and they shall be considered incidental to the contract. Therefore, the CONTRACTOR shall bear any costs associated with all items contained in the "Special Procedures for Seminole County Utilities." Failure to comply with this provision shall be adequate grounds for ENGINEER to withhold pay requests and issue a stop work order at no cost to the COUNTY.

11. For construction projects that are either: (1) primarily roadway projects that include Seminole County utilities within the project boundary or (2) primarily utility projects requiring installation of water and sewer mains on behalf of Seminole County Utilities; then it shall be the responsibility of the CONTRACTOR to provide all sheeting, bracing, shoring, and other forms of support for Seminole County Utilities when working adjacent to or directly upon existing and proposed Seminole County Utilities. The CONTRACTOR shall comply with this requirement throughout the duration of the project, whether the CONTRACTOR is installing or removing roadway infrastructure (including but not limited to (1) stormwater piping and structures; or (2) any proposed traffic signalization devices; or (3) roadwork including the base, sub-base, or final pavement) or installing or removing utilities that are owned by either Seminole County or another utility service company.

**SEMINOLE COUNTY ENVIRONMENTAL SERVICES
DEPARTMENT
CONSTRUCTION PROJECTS
72 HOUR REQUEST FOR SYSTEM SHUT DOWN
(3 WORKING DAYS NOTICE REQUIRED)**

PROJECT NAME AND FC-NUMBER:
GENERAL CONTRACTOR:
CONTRACTOR, SUBCONTRACTOR OR VENDOR PERFORMING WORK:

TYPE OF EQUIPMENT REQUIRING SYSTEM SHUT DOWN:

REFERENCED SECTION OF SPECIFICATIONS OR PAGE OF PLANS:

DATE: _____ AND TIME: _____ OF NOTICE
DATE: _____ AND TIME: _____ WORK IS TO BEGIN.

STARTING TIME: _____ COMPLETION TIME: _____

THE FOLLOWING ARE PEOPLE TO BE NOTIFIED BY CONTRACTOR AS NEEDED AND
PRIOR TO COMMENCEMENT OF WORK.

SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT PEI OFFICE
PHONE #407-665-2014 FAX #407-665-2019

ENGINEER OF RECORD:
ELECTRICAL ENGINEER:
MECHANICAL ENGINEER:
STRUCTURAL ENGINEER:
INSPECTION/ENGINEER :

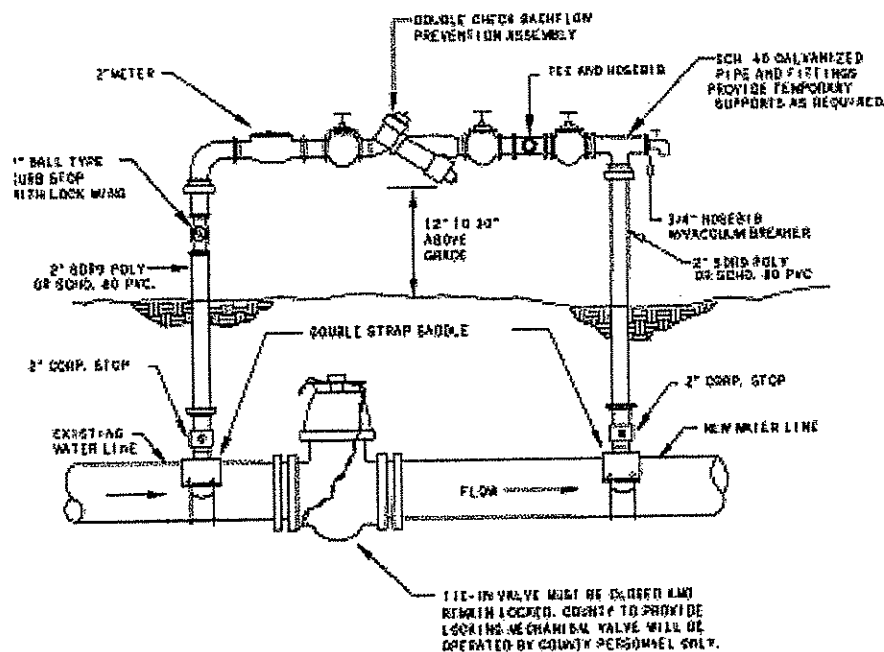
THE FOLLOWING ARE TO BE NOTIFIED BY SEMINOLE COUNTY ENVIRONMENTAL
SERVICES DEPARTMENT CONSTRUCTION PROJECT MANAGER AS NEEDED AND PRIOR
TO COMMENCEMENT OF WORK

SEMINOLE COUNTY WATER SECTION:
SEMINOLE COUNTY WASTE WATER SECTION:
SEMINOLE COUNTY MAINTENANCE SECTION:
OTHERS AS REQUIRED:

CONFIRMATION BY SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

CONSTRUCTION PROJECT MANAGER:

CONFIRMATION BY INSPECTION/ENGINEER:



附註:

1. A TEMPORARY JUMPER CONNECTION IS REQUIRED AT ALL CONNECTIONS BETWEEN EXISTING ACTIVE WATER MAINS AND PROPOSED NEW WATER MAIN IMPROVEMENTS.
2. THE DETAIL ABOVE IS TO BE USED FOR FILLING ANY NEW WATER MAIN OF ANY SIZE FROM EXISTING ACTIVE WATER MAINS AND FOR FILLING OF NEW MAINS UP TO 8" DIAMETER (2.5 FPM MINIMUM VELOCITY) AND FOR PULLING BACTERIOLOGICAL SAMPLES FROM ANY NEW WATER MAIN OF ANY SIZE. THE JUMPER CONNECTION SHALL BE MAINTAINED UNTIL AFTER FILLING, FLUSHING, TESTING, AND DISINFECTION OF THE NEW MAIN HAS BEEN SUCCESSFULLY COMPLETED AND CLEARANCE FOR USE FROM THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) & OTHER PERTINENT AGENCIES HAS BEEN RECEIVED BY SEW. CO. UTILITIES. THIS JUMPER CONNECTION SHALL ALSO BE USED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI IN THE NEW MAINS ALL THE TIME AFTER DISINFECTION AND UNTIL THE FDEP CLEARANCE LETTER IS OBTAINED. ADEQUATE THRUST BLOCKING AND/OR RESTRAINTS SHALL BE PROVIDED TEMPORARILY, AS REQUIRED. PIPE AND FITTINGS USED FOR CONNECTING THE NEW PIPE TO THE EXISTING PIPE SHALL BE DISINFECTED PRIOR TO INSTALLATION IN ACCORDANCE WITH ANNA C&S, 1992 EDITION. THIS TAPPING SLEEVE AND THE EXTERIOR OF THE MAIN TO BE TAPPED SHALL BE DISINFECTED BY SPRAYING OR SWABBING PER SECTION 11.0 OF ANNA C&S-92.

3. FLUSHING OF 16" DIAMETER AND LARGER WATER MAINS MAY BE DONE THROUGH THE TIE-IN VALVE UNDER VERY CONTROLLED CONDITIONS.

THE FOLLOWING PROCEDURES SHALL BE FOLLOWED:

- A. THE TIE-IN VALVES SHALL BE OPERATED AND PRESSURE TESTED IN THE PRESENCE OF THE UTILITY COMPANY AND ENGINEER TO VERIFY WATER TIGHTNESS PRIOR TO TIE-IN. VALVES WHICH ARE NOT WATER TIGHT SHALL BE REPLACED OR A NEW VALVE INSTALLED IMMEDIATELY ADJACENT TO THE LEAKING VALVE.
- B. THE TEMPORARY JUMPER CONNECTION SHALL BE CONSTRUCTED AS DETAILED. THE JUMPER CONNECTION SHALL BE USED TO FILL THE NEW WATER MAIN AND FOR PROVIDING WATER FOR BACTERIOLOGICAL SAMPLING OF THE NEW MAIN AS REQUIRED BY THE FDEP PERMIT.
- C. FLUSHING SHALL NOT BE ATTEMPTED DURING PEAK DEMAND HOURS OF THE EXISTING WATER MAINS.
- D. ALL DOWNSTREAM VALVES IN THE NEW SYSTEM MUST BE OPEN PRIOR TO OPENING THE TIE-IN VALVE.
- E. PROVIDE FOR AND MONITOR THE PRESSURE AT THE TIE-IN POINT. THE PRESSURE IN THE EXISTING MAIN MUST NOT DROP BELOW 35 PSI.
- F. TIE-IN VALVE SHALL BE OPENED A FEW TURNS ONLY, ENSURING A PRESSURE DROP ACROSS THE VALVE IS ALWAYS GREATER THAN 10 PSI.
- G. THE TIE-IN VALVE SHALL BE LOCKED CLOSED BY THE UTILITY COMPANY UNTIL FLUSHING BEGINS.
- H. THE TIE-IN VALVE SHALL BE OPENED ONLY FOR FLUSHING OF THE NEW MAIN. THE PROCEDURE SHALL BE DIRECTED BY THE UTILITY COMPANY AND OBSERVED BY THE ENGINEER.
- I. AFTER FLUSHING, THE TIE-IN VALVE SHALL BE CLOSED AND LOCKED IN THE CLOSED POSITION BY THE UTILITY COMPANY.
- J. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION DEMONSTRATING THAT THE DOUBLE CHECK BACKFLOW PREVENTION DEVICE HAS BEEN TESTED WITHIN ONE YEAR AT THE TIME OF INSTALLATION, & IS IN GOOD WORKING ORDER AT THE TIME OF INSTALLATION. THE TEST SHALL BE PERFORMED BY A QUALIFIED BACKFLOW PREVENTION TECHNICIAN AS APPROVED BY SEMINOLE COUNTY'S CROSS-CONNECTION CONTROL PROGRAM.
- K. EXCEPT AS REQUIRED TO FLUSH LINES OF GREATER THAN 6" IN DIAMETER, THE TIE-IN VALVE SHALL REMAIN CLOSED AND SHALL BE LOCKED IN THE CLOSED POSITION BY THE UTILITY COMPANY. THE TIE-IN VALVE SHALL REMAIN LOCKED CLOSED UNTIL THE NEW SYSTEM HAS BEEN CLEANED FOR USE BY FDEP AND ALL OTHER PERTINENT AGENCIES.
- L. UPON RECEIPT OF CLEARANCE FOR USE FROM FDEP AND ALL OTHER PERTINENT AGENCIES, THE CONTRACTOR SHALL REMOVE THE TEMPORARY JUMPER CONNECTION. THE CORPORATION STOPS ARE TO BE CLOSED AND PLUGGED WITH 2" BRASS PLUGS.
- M. ALL INSTALLATION AND MAINTENANCE OF THE TEMPORARY JUMPER CONNECTION AND ASSOCIATED BACKFLOW PREVENTION DEVICE, FITTINGS, VALVE, ETC., SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TEMPORARY JUMPER CONNECTION

Re: Certification of Clearance for Water Service

Dear

This letter is a reminder that building construction water shall not be used at the job site until a Certification of Clearance has been received from the Department of Environmental Protection (FDEP). Your FDEP permit states, "A letter of clearance must be issued by the Department to you prior to you placing this project into service or you, the permittee, shall be subject to appropriate enforcement action." Pursuant to 403.859 (6), Florida Statutes, "No water service will be provided to this project (other than flushing/testing) unless system has been cleared for use by FDEP." FDEP defines construction water as the water used for flushing, pressure testing and bacteriological testing only. Please refer to the special conditions, if any, on your FDEP permit.

Seminole County Utilities

Owner	_____	_____	_____
	Name	Signature	Date
General Contractor	_____	_____	_____
	Name	Signature	Date
Sub Contractors	_____	_____	_____
	Name	Signature	Date
	_____	_____	_____
	Name	Signature	Date
Others	_____	_____	_____
	Name	Signature	Date
	_____	_____	_____
	Name	Signature	Date

**SEMINOLE COUNTY UTILITIES DIVISION
CONSTRUCTION PROJECTS
7 DAY REQUEST FOR VENDOR OR
MANUFACTURER'S TRAINING**

(7 CALENDAR DAYS NOTICE)

PROJECT NAME AND FC-NUMBER

GENERAL CONTRACTOR:

CONTRACTOR, SUBCONTRACTOR OR VENDOR PERFORMING WORK:

TYPE OF EQUIPMENT REQUIRING SYSTEM TRAINING:

**SECTION OF SPECIFICATIONS OR PAGE OF PLANS REFERRING TO
REQUEST:**

DATE: _____ AND TIME: _____ 7 DAYS PRIOR TO TRAINING

DATE: _____ AND TIME: _____ WORK IS TO BEGIN

**STARTING TIME: _____ COMPLETION TIME: _____ AS PER
SPECIFICATIONS**

**DEPARTMENT OR PEOPLE TO BE NOTIFIED BY CONTRACTOR AS NEEDED PRIOR TO
COMMENCEMENT OF WORK**

**SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT PEI OFFICE
PHONE # 407-664-2014 / FAX # 407-665-2019**

ENGINEER OF RECORD:

ELECTRICAL ENGINEER:

MECHANICAL ENGINEER:

STRUCTURAL ENGINEER:

ENGINEER (CEI):

OTHERS AS REQUIRED:

**DEPARTMENTS TO BE NOTIFIED BY SEMINOLE COUNTY ENVIRONMENTAL SERVICES
DEPARTMENT AS NEEDED PRIOR TO COMMENCEMENT OF WORK.**

(DATE AND TIME)

SEMINOLE COUNTY WATER SECTION:

SEMINOLE COUNTY WASTE WATER SECTION:

SEMINOLE COUNTY MAINTENANCE SECTION:

OTHERS AS REQUIRED:

**CONFIRMATION BY SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT
CONSTRUCTION PROJECT MANAGER:**

REQUEST FOR TEMPORARY METER/CONNECTION
(FLORIDA STATUTE 633.025)
ALLOW SEVEN DAYS FOR PROCESSING OF THIS APPLICATION

DATE OF APPLICATION _____ SIZE REQUESTED _____

APPLICANT'S NAME _____

COMPANY _____

ADDRESS _____

PHONE (_____) _____

LEGAL ADDRESS OF TEMPORARY METER/CONNECTION _____

REASON FOR USE OF TEMPORARY METER/CONNECTION _____

DATES OF USE _____

APPROVED BACKFLOW EQUIPMENT TO BE PROVIDED BY _____

NOTE: A COPY OF THE BACKFLOW ASSEMBLY TEST REPORT MUST BE PROVIDED TO THE
WATER OPERATIONS SUPERVISOR BEFORE INSTALLATION OF ANY TEMPORARY
CONNECTIONS.

REQUEST APPROVED BY _____

SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

DATE _____

REQUEST DENIED FOR THE FOLLOWING REASON(S) _____

DATE _____

FIRE LOSS MANAGEMENT APPROVAL BY _____

DISAPPROVED _____ DATE _____

DEPOSIT AND METER FEES WILL BE REQUIRED FOR ALL CONSTRUCTION CONNECTIONS.

RETURN THIS FORM TO SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT,
BILLINGS OFFICE AT 500 WEST LAKE MARY BLVD., SANFORD, FLORIDA 32773. ALONG WITH
FIRE DEPARTMENT PERMIT ATTACHED.

SEMINOLE COUNTY ENVIRONMENTAL SERVICES

DEPARTMENT CONSTRUCTION PROJECTS

INSPECTION CHECKLIST

As-Built / Plan Inspection

At least four sets of complete as-built plans must be submitted three full working days prior to the scheduled inspection. Should the as-builts be deficient as determined by the County Inspector, Engineer will be notified. Prior to rescheduling the inspection, corrected as-builts must be submitted.

The inspection will also include a visual verification of all water and sewer services, valves, hydrants, manholes and the lift station placement as identified on the as-built plans.

The County inspector will verify installation of locator balls, and will note the location on the plans.

Grooming Inspection (Pre-Final)

- _____ 1. Remove all valve covers on the water, sewer and forcemain systems so valves are visible.
- _____ 2. Valve boxes are plumb and centered on valve.
- _____ 3. Curbs are to be cleaned so that water and sewer service location etchings are visible.
- _____ 4. Remove covers from blow-off valves. Boxes are to be at grade.
- _____ 5. Open all manholes. Verify interior coating from rim to invert.
- _____ 6. Blue reflective markers in the middle of driving lane in front of hydrants.
- _____ 7. Hydrants to be opened and flushed, painted and plumb.
- _____ 8. Valve pads, 24 x 24 x 6 reinforced concrete set to grade, level & square to curb.
- _____ 9. Water and sewer service location to lot line; all lot lines staked by surveyor.
- _____ 10. All previously required inspections must be completed prior to this inspection.

SEMINOLE COUNTY WATER CLEARANCE PROCEDURE

Reference: American Water Works Assoc. (AWWA)

Isolation from the existing system:

To prevent possible contamination of the existing potable water supply, all new water mains construction shall be isolated from existing water lines using jumpered back flow/meter connections and locked valves. See Seminole County Land Development Code detail for standards.

A five step main clearance procedure shall be followed. Each step requires advance scheduling with Seminole County Environmental Services Department.

1. Full Diameter Flush: All new mains shall be purged of contaminants by means of a full diameter flush. The Engineer, Seminole County Utilities Inspector, and contractor will discuss the procedure (AWWA 651-92 page 8) that will satisfactorily accomplish the cleaning. Points and methods of this flushing will be finalized at the preconstruction conference. **A Utilities Inspector shall observe the flushing.**
2. Pressure Test: All new mains shall be pressure tested according to Seminole County Land Development Code specifications and will be discussed at the preconstruction conference. **The Project Engineer and Seminole County Utilities Inspector shall observe and certify a satisfactory pressure test was performed.**
3. Chlorination: All new mains shall be disinfected according to AWWA C-651-92 and the Seminole County Land Development Code. The contractor shall provide a chlorine residual testing device to demonstrate to the utility inspector that a minimum 25mg/l of residual chlorine is present throughout the main 24 hours after disinfection is started. At the preconstruction conference, materials and methods of disinfecting new lines will be discussed.
4. Main Cleaning: After the 25mg/l residual is observed at the end of the 24 hour period, the main shall be cleared of excess chlorine by flushing until a normal potable water residual between 0.2 and 1.0 mg/l is observed.
5. Bacteriological Testing: All sample points must have hose bibs 2 feet above finished grade. The samples will be collected on Tuesday's and Wednesday's of the week. Seminole County Environmental Services Department will accept a faxed copy of the bacteriological test results to help expedite the clearance and approval process. (Fax. forms to 407-665-2019 attention PEI Office.) The certification to be submitted to FDEP must contain an original copy of the bacteriological report.

PROJECT ACCEPTANCE CHECKLIST

Section _____ Township _____ Range _____

Project Name _____ # of Lots _____

Location _____

Developer _____ Engineer _____

Serving Water Plant _____ Serving Sewer Plant _____

Commercial _____ Residential _____

I Plans

A. As-builts Date _____

II Inspections and Tests

A. Preconstruction Conference Date _____

B. Reclaim Pressure Test Date _____

C. Water Pressure Test Date _____

D. Sewer Line Lamping Date _____

E. Force Main Pressure Test Date _____

F. Infiltration/Exfiltration Test Date _____

G. Lift Station Start-up Date _____

H. Fire Hydrant Flow Test Date _____

I. As-built Plan/Locator Ball Inspect. Date _____

J. Grooming Inspection Date _____

K. Final Acceptance Inspection Date _____

III Florida Dept. Of Environmental Protection

A. Bacteriological Test Passed Date _____

B. Certificate of Completion Water Date _____

Sewer Date _____

IV Construction Cost (for acceptance by County)

A. Water _____ Sewer _____ Total _____

B. Lift Station _____

C. Water main footage _____ # of Hydrants _____

Gravity main footage _____ # of Manholes _____

Force main footage _____

Reclaim footage _____

Date _____ Inspector _____

FULL DIAMETER FLUSH OF WATER MAIN
(3 Working Days Notice Required)

Please fill out the information below and fax to:
Seminole County Environmental Services Department
Attention PEI Office
Fax Number 407 665-2019

Project Name _____

Location of Main _____

Size of Main _____

Type of Material _____

Length of Main Being Flushed (STA _____ to STA _____)

Requested Start Time _____

The Utilities Inspector and the Utilities Water Operations Supervisor will be notified.

Contact the PEI office at 407 665-2014, if you have any questions.

SECTION 01010-SUMMARY OF WORK

PART 1 - GENERAL

1.01 LOCATION OF WORK

- A. The potable water main, reclaimed water main, and sanitary force main construction work set forth in these contract documents is to be generally completed in northwest Seminole County, along Markham Woods Road from north of Timberbrook Drive to Markham Road, and along Markham Road from Lake Markham Road to Markham Woods Road.

1.02 DESCRIPTION OF WORK

- A. This project involves the construction of approximately 7,300 linear feet of water main ranging from 6 inches to 12 inches in diameter, approximately 12,830 linear feet of reclaimed water ranging from 4 inches to 24 inches, and approximately 12,000 feet of 12-inch PVC sanitary force main, 12,450 linear feet of 2-inch fiber optic cable, pull rope and pull boxes, along with fittings, valves, miscellaneous appurtenances, testing, site restoration, clean-up, and any incidentals necessary to provide a complete and working installation, ready for operation.
- B. The Contractor shall furnish all labor, materials, equipment, tools, services and incidentals to complete all work required by these Specifications and as shown on the Drawings.
- C. The Contractor shall perform the work complete, in place and ready for continuous service, and shall include repairs, tie-ins, by-pass pumping, testing, permits, cleanup, replacements, and restoration required as a result of damages caused during this construction.
- D. The Contractor shall furnish and install all incidental materials, equipment, and labor which is reasonably and properly inferable and necessary for the proper completion of the work, whether specifically indicated in the Contract Documents or not.
- E. The Contractor shall comply with all County, State, Federal and other codes and regulation applicable to the above construction work.

1.03 CONTRACTOR'S USE OF PREMISES

- A. The Contractor shall assume full responsibility for the protection and safekeeping of products and materials stored at the job site. If additional storage or work areas are required, they shall be obtained by the Contractor at no additional cost to the Owner.

- 1.04 EQUIPMENT AND MATERIAL PURCHASED BY THE CONTRACTOR AND
DELIVERED TO THE COUNTY
- A. The contractor shall purchase locators for electronic marker balls for the water,
reclaimed water, and force main systems. Locators shall meet the requirements
of Section 02666.
- 1.05 EQUIPMENT AND MATERIAL SUPPLIED BY THE COUNTY
- A. None.

END OF SECTION

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. Coordinate the work of all trades so that each will have sufficient space and time within which to work properly and efficiently.
- B. The Contractor shall review, approve, and submit with reasonable promptness and in such sequence as to cause no delay in his work or the work of subcontractors, all submittals required by the Contract Documents.
- C. The Contractor shall provide for the coordination of his work with the required work of public agencies and utilities which includes but is not limited to:
 - 1. Public Services
 - 2. Equipment supplied by Seminole County.
- D. Contractor shall coordinate with property owners to provide access during open cuts or other operations that will impact the use of roads or sidewalk.
- E. Changes in the intended design of the project as a result of improperly coordinated construction work will not be tolerated. Delays in the work caused by rejections of installed materials due to improper coordination, and as otherwise specified, will not be considered valid justification for extensions of contract time.

END OF SECTION

SECTION 01060 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Special Conditions apply to the Work specified in this section.

1.02 SPECIFIED CODES

- A. The site work is based on the latest edition of the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, hereinafter referred to as Florida D.O.T. Specifications or D.O.T. Specs, and requirements of Seminole County.
- B. The design of the Work is based on the requirements of the Florida Department of Environmental Protection, the National Fire Protection Association, and Seminole County.
- C. The Contractor shall ensure the Work complies to the aforementioned codes and regulations as they apply to the project whether or not specifically referenced elsewhere.

1.03 REFERENCE STANDARDS

- A. Except as otherwise required by Paragraph 1.02, all products and workmanship shall conform to best quality materials and practices recognized by agencies, associations, councils, etc., specified in individual sections.
- B. In the absence of specified agencies, associations, councils, etc., the Contractor shall conform to the requirements of the most widely recognized standards for each particular portion of the Work.

1.04 PROJECT PERMITS

- A. The Contractor shall obtain from the County copies of all permits that have been issued by regulatory agencies.
- B. The Contractor shall review and become familiar with all permits for the Project, complete with all conditions, attachments, exhibits and permit

01060-1

modifications. A copy of all permits for the Project shall be maintained by the Contractor at the site, and shall be available for review upon request.

C. Permits obtained by the Owner

The Owner will apply for the following permits:

1. FDEP Application for a Specific Permit to Construct PWS Components
2. FDEP Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System

D. Permits obtained by the Contractor

1. United States Environmental Protection Agency (USEPA) Stormwater Pollution Prevention Plan (SWPPP)
2. Seminole County Right-of-way Permit
3. St. John's River Water Management District (SJRWMD) dewatering permit.

- E. The Contractor shall be fully responsible to abide by all provisions of the permits. The Contractor is responsible for the selection; implementation and operation of all measures required by the permits, including the maintenance of said measures as necessary during construction. No additional compensation will be allowed for any work associated with the permit requirements.

END OF SECTION

01060-2

SECTION 01070 - ABBREVIATIONS

PART 1 - GENERAL

1.01 ABBREVIATIONS

- A. References to technical societies, institutions, associations, or governmental authorities are made in accordance with the following abbreviations:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWS	American Welding Society
AWWA	American Water Works Association
FM	Factory Mutual System
Fed. Spec. or FS	Federal Specifications
IRI	Industrial Risk Insurers
NAAMM	National Association of Architectural Metal Manufacturers
NBS	National Bureau of Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
SDI	Steel Deck Institute or Steel Door Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
UL	Underwriters' Laboratories, Inc.

END OF SECTION

01070-1

SECTION 01150 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 GENERAL

- A. Payment for all Work done in compliance with the Contract Documents, inclusive of furnishing all manpower, equipment, materials, and performance of all operations relative to construction of this project, will be made under Pay Items listed herein. Work, for which there is not a specific Pay Item listed herein but is necessary for complete execution of the Work, will be considered incidental to the Contract and no additional compensation will be allowed.
- B. Measurement and payment will be based upon Work completed and accepted in accordance with the Contract Documents. No separate payment will be made for excavation, trenching, dewatering, backfilling, leakage tests, surveying, concrete or soil tests or other incidental items of Work not specifically stated in the Agreement or listed in the Bid Schedule but required for completing the Work. The described items apply for all applicable parts in the Bid Schedule. All work shown on the Drawings, herein specified, or implied in any way in the Drawings or Specifications shall be done regardless of whether or not the work is specifically defined in any bid item.
- C. Work shall not be considered complete until all testing has been satisfactorily completed and the item of work has demonstrated compliance with plans and specifications.
- D. The bid items shown on the Bid Schedule have been created solely for the purpose of comparison of bids and for use in the preparation of monthly construction estimates. Quantities shown thereon must be considered as approximate only and should not be used by the Contractor as a basis for ordering materials. The Contractor shall conduct his own independent analysis of the work to determine necessary material quantities to complete the work and order all materials based on his independent quantity determinations.
- E. All measurement for payment will be based on complete work performed in strict accordance with the Drawings and Specifications. All work completed under this contract shall be measured by the Contractor in the presence of the Owner or his representative according to the methods outlined below.
- F. The County reserves the right to alter the Drawings, modify incidental work as may be necessary, and increase or decrease quantities of work to be performed to accord with such changes, including deduction or cancellation of any one or more of the Pay Items. Changes in the work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. When changes result in changes in quantities of Work to be performed, the Contractor will accept payment according to Contract Unit

Prices that appear in the original Contract. A supplemental agreement between the Contractor and the County will be required when such changes involve a net increase or decrease of more than 25 percent of the estimated quantity of a payment item in cases where the particular pay item amounts to 10% or more of the Contract Price.

- 1.02 **EQUIPMENT AND MATERIAL IN STORAGE:** Payment for materials and equipment in proper storage at the site of the Work or other approved storage site will be made for those items for which the Contractor has submitted paid invoices to the Engineer, less ten percent retainage.

If stored off-site, proper storage requires that the materials are stored in a bonded warehouse and proof of the bonding insurance must be provided to the County. The Contractor shall be wholly responsible to replace any and all items that are lost or stolen whether stored on site or in a bonded warehouse. This replacement shall be done by the Contractor at no additional cost to the County. The County shall not be responsible for materials and equipment that become damaged or stolen if the Contractor chooses to store said materials and equipment on-site.

PART 2 - MEASUREMENT AND PAYMENT

2.01 MOBILIZATION, BONDS, AND PERMITS (Bid Item 1.0)

- A. **Measurement** - The work specified in this pay item will be measured as a lump sum. The Work consists of the preparatory work and operations in mobilizing for beginning the construction project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of Contractor's temporary offices, buildings, safety equipment, first aid supplies, sanitary and other facilities, as required by these Specifications, special provisions, and State and local laws and regulations. The costs of bonds, permits and any required insurance, and any other pre-construction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item. The amount for this item shall not exceed five percent (5%) of the total bid price.
- B. Payment for this lump sum pay item will be made at the applicable lump sum price listed in the Bid Schedule. The price to be paid for this item shall be based on such work being completed and accepted. The standard retainage will be applied to this item.

2.02 CLEARING AND GRUBBING (Bid Item 2.0)

- A. **Measurement** - The work specified in this pay item will be measured as a lump sum. The work consists of removing and disposing of all trees, stumps, roots and other such protruding objects, and other facilities necessary to prepare the area for the proposed construction, obtaining

permits for hauling and disposal in areas where such permits are required, clean-up, and all other requirements of Section 02110.

- B. Payment for this lump sum pay item will be made at the applicable lump sum price listed in the Bid Schedule. The price to be paid for this item shall be based on such work being completed and accepted.

**2.02 POTABLE, RECLAIMED WATER AND FORCE MAIN (Bid Items 3.0 through 17.0)
(installation by open trenching)**

- A. Measurement - This pay item will be measured as lineal feet of pipe installed at the proper location and depth using open trench construction methods in accordance with the Drawings and Specifications. The unit prices to be paid for this item shall include all labor, equipment, materials, excavation, dewatering, shoring, pipe, connection to existing piping, maintenance of traffic, mechanical restraining devices, backfilling, compaction, locating wire, warning identification tape, electronic marker balls, sod restoration, flushing, disinfection, testing, and any necessary incidentals to provide a completed water, reclaimed water, and force main systems ready for service. Measurement and payment for ductile iron fittings for potable water and reclaimed water mains shall be based separately as described in Article 2.05 of this Section. PVC fittings for force main shall be included in the cost of the pipe. The prices shall also include any temporary piping systems necessary to maintain service, or testing, as specified. The unit prices shall also include the temporary removal and replacement of miscellaneous items such as storm pipes, signs, fencing, etc.
- B. Payment will be made based on the actual measured number of lineal feet of pipe of the various type and sizes installed and the applicable contract unit price stated in the Bid Schedule.

2.03 HDPE RECLAIMED WATER MAIN (Bid Item 18.0) (installation by horizontal directional drilling)

- A. Measurement - This pay item will be measured as lineal feet of HDPE pipe installed at the proper location and depth using horizontal directional drilling construction methods in accordance with the Drawings and Specifications. The unit prices to be paid for this item shall include all labor, equipment, materials, required excavation, dewatering, shoring, pipe, connection to existing piping, maintenance of traffic, mechanical restraining devices, required transition couplings to connect to standard ductile iron pipe or PVC pipe, backfilling, compaction, locating wire, warning identification tape, electronic marker balls, necessary restoration, flushing, disinfection, testing, and any necessary incidentals to provide a completed system ready for service. The prices shall also include any temporary piping systems necessary to maintain service, or testing, as specified. The unit prices shall also include the temporary removal and replacement of miscellaneous items such as storm pipes, signs, fencing, etc.

- B. Payment will be made based on the actual measured number of lineal feet of pipe of the various type and sizes installed and the applicable contract unit price stated in the Bid Schedule.

2.04. ABANDON AND GROUT EXISTING PIPE (Bid Item 19.0)

- A. Measurement of this pay item is based on the actual lineal feet of existing water main to be abandoned in place, and plugged and filled with grout as indicated on the Drawings and specified herein. The price to be paid for this work under this bid item shall include the cost of all labor, equipment, materials, excavation, dewatering, cutting, pumping, plugging, grouting, backfilling, compaction, disposal, restoration, sodding, and all other incidental labor and materials necessary for abandonment, plugging and grouting of the existing piping as shown on the Drawings and specified herein. Removal of in-line valves and appurtenances, as directed by the Owner, shall be included as part of the bid price for this bid item as well as the cost of furnishing and installing pipe plugs and caps.
- B. Payment will be based on the number of lineal feet of pipe of the types abandoned in accordance with the Drawings and Specifications, and the bid proposal's unit prices.

2.05. REMOVE EXISTING PIPE (Bid Item 20.0)

- A. Measurement of this pay item is based on the actual lineal feet removed as shown on the Drawings. The work of this item shall include all labor, materials, and equipment to drain, dispose of the contents, plug or cap, and remove existing pipes of all services and sizes, including fittings and other in-line devices, designated "to be removed" on the Drawings. Also included in this item are the removal, disposal, and salvage of existing valves and valve boxes, and fire hydrant assemblies located on the piping designated to be removed.
- B. Payment will be based on the actual number of lineal feet of pipe of the types removed in accordance with the Drawings and Specifications, and the bid proposal's unit prices.

2.06 STEEL CASING (Bid Items 21.0 through 26.0) (installation by bore and jack)

- A. Measurement - This pay item will be measured as lineal feet of steel casing installed at the proper location and depth using boring and jacking construction methods in accordance with the Drawings and Specifications. The unit prices to be paid for this item shall include all labor, equipment, materials, excavation, dewatering, shoring, steel casing, welding, maintenance of traffic, backfilling, compaction, necessary restoration, and any necessary incidentals to provide a steel casing completed and ready for accepting a carrier pipe. In addition, the unit prices for the steel

casings shall also include the cost of furnishing and installing the casing spacers for the carrier pipe and the brick and mortar or rubber end caps at the ends of the casings. The unit prices shall also include the temporary removal and replacement of miscellaneous items such as storm pipes, signs, fencing, etc.

- B. Payment will be made based on the actual measured number of lineal feet of steel casing of the various type and sizes installed and the applicable contract unit price stated in the Bid Schedule.

2.07 DUCTILE IRON FITTINGS (Bid Item 27.0)

- A. Measurement – This pay item will be measured as the actual weight, in tons, of ductile iron fittings installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, fittings, mechanical restraining devices, excavation, backfill, compaction, flushing, disinfection, testing, restoration, and any necessary incidental items to provide fittings completely installed and ready for service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.
- B. Payment will be made based on the actual weight, in tons, of fittings installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.08 GATE VALVE AND VALVE BOX (Bid Items 28.0 through 34.0)

- A. Measurement – This pay item will be measured as the actual number of valves and valve boxes installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, valves, valve box, excavation, backfill, compaction, flushing, disinfection, testing, restoration, and any necessary incidental items to provide a gate valve complete and ready for service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.
- B. Payment will be made based on the actual number of valves and valve boxes of the various types and sizes installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.09 PLUG VALVE AND VALVE BOX (Bid Items 35.0 and 36.0)

- A. Measurement – This pay item will be measured as the actual number of valves and valve boxes installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, valves, valve box, excavation, backfill, compaction, flushing, disinfection, testing, restoration, and any necessary incidental items to provide a plug valve complete and ready for service.

Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.

- B. Payment will be made based on the actual number of valves and valve boxes of the various types and sizes installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.10 FIRE HYDRANT ASSEMBLY (Bid Item 37.0)

- A. Measurement – This pay item will be measured as the actual number of fire hydrant assemblies installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, piping, fire hydrant, valve, valve box, restraining devices, concrete hydrant collar, concrete valve collar, bedding gravel, excavation, backfill, compaction, flushing, disinfection, testing, restoration, and any necessary incidental items to provide a fire hydrant assembly complete and ready for service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.

Note: The main line tee that the hydrant assembly is connected to is not included with this bid item. The main line tee shall be included and paid for under Bid Item #27.0.

- B. Payment will be made based on the actual number of fire hydrant assemblies installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.11 AIR-RELEASE & VACUUM VALVE ASSEMBLY (Bid Item No. 38.0)

- A. Measurement: The quantity for payment shall be the actual number of air release valves with concrete vaults of each type, size, and service, satisfactorily constructed to provide a complete and functional unit.
- B. Payment: Payment of the applicable unit price shall be full compensation for furnishing all labor, materials, and equipment to install the valve including saddle, fittings, pipe, ARVV, pre-cast vault, manhole rim and cover, excavation, dewatering, backfill, compaction, and clean up.

2.12 MANUAL BLOW-OFF ASSEMBLY (Bid Item 39.0)

- A. Measurement – This pay item will be measured as the actual number of blow-off assemblies installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, piping, valves, meter box, restraining devices, concrete collar, concrete valve collar, bedding gravel, excavation, backfill, compaction, flushing, disinfection, testing, restoration, and any necessary incidental items to provide a fire hydrant assembly complete and ready for

service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.

- B. Payment will be made based on the actual number of blow-off assemblies installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.13 TAPPING SLEEVE AND TAPPING VALVE (Bid Items 40.0 through 44.0)

- A. Measurement – This pay item will be measured as the actual number of tapping sleeves and tapping valves with valve boxes installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, equipment, materials, tapping sleeve, tapping valve, valve box, pipe tapping, excavation, backfill, compaction, flushing, disinfection, testing, and any necessary incidental items to provide a tapping sleeve and tapping valve completely installed, including the tap of the parent pipe, and ready for service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.

- B. Payment will be made based on the actual number of tapping sleeves and tapping valves of the various types and sizes installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.14 RECLAIMED AND POTABLE WATER SERVICE ASSEMBLY (Bid Items 45.0 through 47.0)

- A. Measurement – This pay item shall be measured as the actual number of water service assemblies installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, materials, equipment, water service pipe, corporation stop, service saddle, casing for long-side services, curb stop, meter box, pipe tap, excavation, backfill, compaction, testing, and any necessary incidental items to provide potable water and reclaimed water service assemblies complete and ready for service. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.

- B. Payment will be made based on the actual number of potable water and reclaimed water service assemblies installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.15 REMOVE AND REPLACE ASPHALT PAVEMENT (Bid Item 48.0)

- A. Measurement - This pay item shall be measured as the actual number of square yards of asphaltic concrete pavement removed and replaced within the specified pay limits. The specified pay limits include a maximum width of 10 feet (5 feet on each side of the centerline) of disturbed area along the pipe alignment, unless otherwise shown on the

Drawings. Areas disturbed beyond the 10-foot width shall be restored to their original condition, or better, by the Contractor, at no cost to the Owner. The unit price set forth in the Bid Schedule shall be considered full compensation for all labor, equipment, materials, cutting, removal and disposal of existing road materials, temporary patching, base construction or reconditioning, paving, and other incidentals required to remove and restore asphaltic concrete pavement as shown on the Drawings and specified herein.

Note: On intersections where the turning radii are to be increased, the asphalt replacement shall include construction of new base in accordance with the Drawings and these Specifications.

- B. Payment shall be based on the actual number of square yards of asphaltic pavement removed and restored, completed and accepted, within the pay limits, and the unit price bid stated in the Bid Schedule

2.16 REMOVE AND REPLACE CONCRETE DRIVEWAYS (Bid Item 49.0)

- A. Measurement – This pay item shall be measured as the actual number of square yards of concrete driveways removed and replaced. Payment shall be based on the actual number of concrete driveways completely restored and accepted, and the unit price stated in the Bid Schedule. The unit price set forth in the Bid Schedule shall be considered full compensation for providing all labor, equipment, materials, cutting, removal and disposal of existing materials, base reconstruction, temporary patching, compacting, concrete materials, and necessary incidentals to completely remove and restore concrete driveways as shown on the Drawings and specified herein.
- B. Payment will be made based on the actual number of square yards of concrete driveways removed and replaced, complete and accepted, and the applicable contract unit price stated in the Bid Schedule.

2.17 REMOVE AND REPLACE CONCRETE SIDEWALK (Bid Item 50.0)

- A. Measurement- This pay item shall be measured as the actual lineal feet of concrete sidewalk removed and replaced. The work will include all labor, equipment, materials, sidewalk removal, proper disposal of removed sidewalk, temporary sidewalks or walkways, site preparation, grading, formwork, concrete work, handicapped ramps (including truncated domes), restoration, sodding and any other incidentals to provide a completed sidewalk.
- B. Payment will be made on the measured lineal feet of sidewalk removed, replaced, and accepted by the Owner, and the applicable unit price stated in the Bid Schedule.

2.18 REMOVE AND REPLACE CONCRETE CURB (Bid Item 51.0)

- A. Measurement – This pay item shall be measured as the actual lineal feet of concrete curb removed and replaced. Payment shall be based on the actual number of lineal feet of concrete curb completely removed and restored and accepted, and the unit price stated in the Bid Schedule. The unit price set forth in the Bid Schedule shall be considered full compensation for providing all labor, equipment, materials, cutting, removal and disposal of existing curb materials, temporary patching, compacting, forming, concrete materials, and necessary incidentals to completely remove and restore concrete curbs as shown on the Drawings and specified herein.
- B. Payment will be made based on the actual number of lineal feet of concrete curbs removed and replaced, complete and accepted, and the applicable contract unit price stated in the Bid Schedule.

2.19 RESTORATION OF OPEN CUT AREAS (Bid Item 52.0)

- A. The work specified in this pay item will be measured as a lump sum. The work includes performing an inventory of trees, bushes, shrubs and grasses that will be disturbed with open cut operation by a licensed arborist, providing a landscaping plan defining the number, size, type of trees, bushes, shrubs and grasses, and location of plantings in areas disturbed by open cut operation, sodding all areas disturbed by open cut, installing all trees, bushes, shrubs, grasses, and plantings, and all other labor required to complete the above tasks.
- B. Payment for this lump sum pay item will be made at the applicable lump sum price listed in the Bid Schedule. The price to be paid for this item shall be based on such work being completed and accepted.

2.20 FIBER OPTIC CONDUIT (Bid Item 53.0)

- A. Measurement – This pay item shall be measured as the actual lineal feet of fiber optic conduit, installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, materials, equipment, conduit, installation of the pull string into the conduit runs, excavation, backfill, compaction, testing, restoration, and any necessary incidental items to provide a fiber optic cable system complete and ready for future cable. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.
- B. Payment will be made based on the actual lineal feet of conduit installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.21 FIBER OPTIC PULL BOXES (Bid Item 54.0)

- A. Measurement – This pay item shall be measured as the actual number of pull boxes, installed in accordance with the Drawings and Specifications. The unit price for the bid item shall include the cost of all labor, materials, equipment, pull boxes, excavation, backfill, compaction, testing, restoration, and any necessary incidental items to provide a fiber optic cable pull boxes complete and ready for future cable. Payment will be based on the work being completed and accepted and the unit price stated in the Bid Schedule.
- B. Payment will be made based on the actual number of pull boxes installed, complete and ready for service, and the applicable contract unit price stated in the Bid Schedule.

2.22 EXECUTION OF GENERAL REQUIREMENTS (Bid Item 55.0)

- A. The work specified under this item consists of furnishing all labor, material, equipment, and incidentals necessary to complete the work specified in "Division I - General Requirements." The work may include, but not be limited to, the following:
 - Special project coordination
 - Project meetings
 - Preparation of construction schedules
 - Field engineering & surveying
 - Materials testing and assistance to testing personnel employed by the Owner.
 - Preparation and submittal of pay requests
 - Preparation and submittal of shop drawings
 - Construction photographs
 - Audio-visual documentation
 - Preparation and submittal of record drawings and other record documents
 - Maintenance of traffic
 - Erosion and sedimentation control
 - Cleanup
- B. Payment for the work performed under this bid item will be the lump sum bid price stated in the Bid Schedule for this item. Measurement of Payment will be made based on the overall percentage of the entire project, which has been completed. However, payment of the lump sum bid price will not exceed 80 percent until the project record drawings have been submitted by the Contractor and accepted by the Owner.

2.23 DIRECTIONAL DRILLING (ALTERNATE BID ITEMS A-1 through A-7)

A. Measurement - This pay item will be measured as lineal feet of installed pipe at the proper location and depth using horizontal directional drilling construction methods for the reclaimed water main, potable water main, and sanitary force main in lieu of open cut installation. If the alternate is selected, the following bid items will be eliminated:

- Clearing and grubbing (Bid Item 2.0)
- Reclaimed water, potable water and sanitary force mains by open cut installation (Bid Items 3.0 through 17.0)
- Steel casing installation by bore and jack (Bid Items 21.0 through 26.0)
- Ductile iron fittings (Bid Item 27.0)
- Air release/vacuum valve assemblies (Bid Item 38.0)
- Asphalt pavement removal and replacement (Bid Item 48.0)
- Concrete driveway removal and replacement (Bid Item 49.0)
- Concrete sidewalk removal and replacement (Bid Item 50.0)
- Concrete curb removal and replacement (Bid Item 51.0)
- Open cut restoration (Bid Item 52.0)

The work shall include the requirements of Paragraph 2.03 of this Specification and providing an installation plan that includes a written documentation of installation methods, equipment and computations justifying depth of drill, individual pipe sizes and quantities.

Note: The depth of all valves and roadway crossings shall not exceed 6 feet, in accordance with Section 02405 of these Specifications.

B. Payment will be made based on the actual measured number of lineal feet of pipe of the various type and sizes installed and the applicable contract unit price stated in the Bid Schedule.

END OF SECTION

SECTION 01200 - SPECIAL CONDITIONS

The following special conditions apply strictly to those utilities belonging to the Seminole County Environmental Services Department. All references to the "Contract Documents" are intended to include the complete bid documents (which consist of the General Conditions, Special Procedures, Plans, Technical Specifications, and any Addenda), Change Orders, and Contractual Agreements between the COUNTY and the CONTRACTOR pertaining to the specific project. UNLESS OTHERWISE NOTED, no specific pay item is provided for the conditions itemized and described in this Section and the cost for the labor, equipment, and materials associated with these items, including the requirements of Federal, State, and local agencies with jurisdiction over the work detailed in the Contract Documents shall be considered incidental to the contract. Therefore, the CONTRACTOR shall bear any costs associated with these Special Conditions. Failure to comply with these provisions shall be adequate grounds for ENGINEER to withhold pay requests and issue a stop work order at no cost to the COUNTY.

- 1.01 The CONTRACTOR shall be responsible to install locator balls on all Seminole County Utilities lines installed and/or worked upon during the project. The locator balls shall be located on potable water mains, reclaimed water mains, and force mains at one hundred foot intervals, and at all bends, "T's", valves, and any changes in direction on fittings. The balls shall be located not less than 18 inches and not greater than 24 inches below the final finished grade. The balls shall be blue for potable water, purple for reclaimed water, and green for sewer. The location of these balls shall be reflected on the as-built drawings with the abbreviations of (WLB) for "water locate balls", (SLB) for "sewer locate balls", and (RLB) for "reclaimed locate balls".
- 1.02 Where specifically called for in the bid form pay items, the CONTRACTOR shall be responsible for providing Seminole County Environmental Services Department with a marker ball locator device as part of the construction contract. All locator devices shall be delivered by the CONTRACTOR to the COUNTY through the ENGINEER no later than 30 days after the Notice to Proceed is issued. In addition, Seminole County Environmental Services Department shall not perform any field utility locates for the contractor nor allow any subsurface excavation in the vicinity of existing County utilities until the locator ball devices are provided to the County and determined to be fully functioning and acceptable. Locator devices are specified in Section 02666, 1.01 B.

- 1.03 The CONTRACTOR shall be responsible for the removal and proper disposal of all asbestos cement (AC) pipe. The removal and disposal shall be in compliance with all applicable Federal, State, and local regulations regarding asbestos cement pipe. The pay item provided in the bid form associated with abandonment of AC pipe is intended to be inclusive of all costs associated with this item description.
- 1.04 It shall be the responsibility of the CONTRACTOR to obtain the services of a licensed professional land surveyor to survey the as-built location of the relocated utilities, including the locator balls, and make this information available to the Engineer that will serve as the Engineer of Record or CEI for the Seminole County Environmental Services Department systems. It shall be the responsibility of the Engineer serving as the Engineer of Record or CEI for the Seminole County Environmental Services Department systems to prepare and submit as-built drawings to both Seminole County Utilities and the Florida Department of Environmental Protection based upon the information provided by the CONTRACTOR and his or her surveyor, and inspection performed by the COUNTY and the ENGINEER. Partial system as-builts required for partial clearances from FDEP during the construction process shall be prepared by the CONTRACTOR at no additional cost to the County.
- 1.05 UTILITIES INFRASTRUCTURE MAINTENANCE
- A. Throughout the entire duration of the construction process and within the construction project boundaries, it shall be the responsibility of the CONTRACTOR to maintain the quality of groundwater and the location of all active Seminole County Utilities service lines and all utility lines that are pressurized (whether presently owned or to be owned in the future by Seminole County Utilities) by identifying, by preserving, and by protecting all valves (with their associated boxes and lids) and manholes. These locations must remain visible and accessible to Seminole County Utilities personnel.
- B. Protection shall be provided in the form of a 4" PVC conduit with a minimum burial of four feet and a minimum above-ground exposure of four feet. The entire circumference of the top 4" of the pipe shall be color-coded using blue paint to indicate water, green paint to indicate sewer, and purple paint to indicate reclaimed water.
- C. Protection shall be installed by the CONTRACTOR after the Notice to Proceed but prior to any work (including preliminary clearing and grubbing) being performed within the construction project limits. Until the required protection is installed, the CONTRACTOR is strictly prohibited from

performing any preliminary clearing or grubbing or excavating in areas that are adjacent to or include Seminole County Utilities.

D. Protection of utility lines that are to be removed and/or taken out of service shall be removed only after the following conditions are met:

- 1) The replacement line is in service and approved for operation by the Florida Department of Environmental Protection and the ENGINEER and accepted by Seminole County Environmental Services Department.
- 2) All service connections have been relocated from the utility line to be taken out of service, to the utility line that has been placed in active service with approvals from the Florida Department of Environmental Protection, the ENGINEER, and the Seminole County Environmental Services Department.
- 3) The utility line to be taken out of service has been depressurized.

E. With respect to the utility lines that are to be the final utility lines in service at the completion of construction, the protection shall be removed by the CONTRACTOR only after the final site restoration (including final sodding of all disturbed areas) has been accepted by the ENGINEER.

1.06 The CONTRACTOR and subcontractor shall be responsible for maintaining the quality of groundwater near the construction site until completion of all work and acceptance by the Engineer. If work is performed within 150' of potable water wells or groundwater monitoring wells, then at all times during construction and testing, the CONTRACTOR and subcontractor shall take necessary precautions to prevent tampering of the well or the entrance of contaminants into the well. The CONTRACTOR and subcontractor shall be responsible for returning the water to its original quality in a timely manner should contamination occur, regardless of the presence of wells. Only dual contained, portable fuel tanks shall be utilized.

1.07 The CONTRACTOR shall be responsible for adjusting all manholes, valve boxes, lids, water meters, and similar structures to match the final project finished grade, regardless of whether other utility work is performed.

1.08 MAIN TESTING AND CLEARANCE

A. It shall be the responsibility of the CONTRACTOR to perform all water main pressure tests, and water main disinfection in preparation for subsequent bacteriological testing by the COUNTY'S designated laboratory. The

CONTRACTOR shall be responsible for force main pressure tests. These tests (including disinfection) are considered incidental to the utility work.

- B. It shall be the responsibility of the CONTRACTOR to provide a "flushing plan" to Seminole County Environmental Services Department at the Utilities preconstruction conference. This plan shall clearly indicate the volumes to be flushed and the disposal methodology for the flush water as well as the launching points and retrieval locations required for the pigs and swabs which shall be considered part of the "flushing plan." Further, it shall be the responsibility of the CONTRACTOR to obtain any permits associated with the flushing activity including but not limited to National Pollutant Discharge Elimination Systems (NPDES) permits. Flushing of lines shall be considered incidental to the utility work.
- C. The CONTRACTOR shall be entirely responsible to coordinate and schedule the full diameter flushing activity and shall provide written notification to the COUNTY through the ENGINEER a minimum of 48 hours prior to commencing the flushing activity. The ENGINEER shall be responsible to notify Seminole County Environmental Services Department. All temporary piping associated with the flushing shall be provided and installed by the CONTRACTOR and is considered incidental to the utility work.
- D. Neither the COUNTY nor the ENGINEER shall be held responsible for delays to the CONTRACTOR awaiting a "Letter of Clearance" or "Release for Use" from the Florida Department of Environmental Protection (FDEP) to operate either the collection or distribution systems. It shall be the responsibility of the CONTRACTOR to make provisions for the time to obtain these releases from FDEP when planning his "Schedule of Construction."

1.09 SALVAGE OF EXISTING UTILITIES

- A. For projects including the salvage of existing Seminole County Utilities, CONTRACTOR shall exercise the appropriate care necessary to remove and stockpile all existing Seminole County Utilities (including, but not limited to, all piping, bends, valves, tees, fittings, hydrants, and appurtenances) in such a manner as to preserve the materials for future use. Salvaged materials shall be removed and stock piled, hauled, unloaded and stored in an orderly manner at the direction of Seminole County Environmental Services Department in an orderly manner by the CONTRACTOR at the Southeast Regional Water Treatment Plant located at 3300 Dike Road in Winter Park. The pay item provided in the Bid Form referencing pipe

removal is intended to be inclusive of all costs associated with the item description provided above.

- B. The CONTRACTOR shall contact the Seminole County Environmental Services Department's Maintenance Supervisor at (407) 665-2739 to arrange for the delivery of any salvaged materials to the location designated by Seminole County Environmental Services Department. The condition of the materials cannot be guaranteed, as they shall be subject to the normal excavation and handling procedures used on the project.
- C. The CONTRACTOR shall be responsible for the removal and disposal of all utility lines taken out of service. The CONTRACTOR shall be responsible for Seminole County utilities that are damaged and/or deemed unsalvageable by Seminole County Utilities.
- D. The COUNTY will identify which materials will be salvaged and delivered to the COUNTY. All other materials are to be disposed of by the CONTRACTOR at the CONTRACTOR'S expense. Proper disposal of these materials is considered incidental to the removal Pay Item.

1.10 CONTRACTOR SCHEDULING IN ORDER TO MAINTAIN SERVICE

- A. It shall be the responsibility of the CONTRACTOR through scheduling, to maintain service to Seminole County customers and to minimize conflicts with existing Seminole County service lines.
- B. For construction projects that are primarily roadway projects that include the relocation of Seminole County utilities within the project boundary, then if an existing Seminole County water or sewer main is located within 100 feet of any (1) proposed stormwater structures or conveyance piping; or (2) any proposed traffic signalization control devices; or (3) proposed roadway work including the base, sub-base, or final pavement; or (4) any related roadway infrastructure; AND in all instances where the plans clearly indicate that the existing utilities in this vicinity are to be relocated; then the CONTRACTOR shall be required to relocate the existing utility and place it in service prior to commencement of any subsurface excavation for installation of the aforementioned items listed in (1) through (4).
- C. If the CONTRACTOR is installing the roadway infrastructure listed in Item B (above) and encounters a conflict with an existing utility line, the County shall not consider any additional compensation due the CONTRACTOR unless the CONTRACTOR has abided by the requirements of Item B. This condition applies regardless of whether the conflicting line was previously undetected or is clearly depicted on the plans.

D. The CONTRACTOR assumes the cost of providing any temporary utilities conflict provisions. This provision shall require the CONTRACTOR to bear all costs associated with the installation of various bends, piping and fittings that are installed on existing water and sewer mains that will ultimately be taken out of service when such installations are installed to benefit the CONTRACTOR and allow him to continue to install the roadway and utility infrastructure as detailed by the Contract Documents.

E. For construction projects that are primarily roadway projects that include the relocation of Seminole County utilities within the project boundary, then it shall be the responsibility of the CONTRACTOR to relocate or adjust all Seminole County Utilities in accordance with the Contract Documents. Should a conflict arise between the relocated or existing utilities and the subsequent construction of the roadway and its associated infrastructure, it shall be the responsibility of the CONTRACTOR to relocate or adjust the utilities, providing the necessary piping, bends, tees, and fittings to resolve the conflict. Relocations of this nature shall be approved in advance of said work by both the ENGINEER and Seminole County Environmental Services Department. Such relocations shall be reflected on the as-built drawings upon completion of the actual installation and such relocations shall be constructed at no additional cost to the COUNTY.

F. The CONTRACTOR shall be responsible for coordinating the installation of new COUNTY utilities, or removal of existing COUNTY utilities with other utilities, including but not limited to telephone, fiber optic, gas and power. All costs associated with such coordination, or with any construction activities required for coordination, shall be the responsibility of the CONTRACTOR at no additional cost to the COUNTY.

1.11 For construction projects that are either: (1) primarily roadway projects that include Seminole County utilities within the project boundary or (2) primarily utility projects requiring installation of water and sewer mains on behalf of Seminole County Environmental Services Department; then it shall be the responsibility of the CONTRACTOR to provide all sheeting, bracing, shoring, and other forms of support for Seminole County Utilities when working adjacent to or directly upon existing and proposed Seminole County Utilities. The CONTRACTOR shall comply with this requirement throughout the duration of the project, whether the CONTRACTOR is installing or removing roadway infrastructure (including but not limited to (1) stormwater piping and structures; or (2) any proposed traffic signalization devices; or (3) roadwork including the base, sub-base, or final pavement) or installing or removing utilities that are owned by either Seminole County or another utility service company.

1.12 SCHEDULED INTERRUPTIONS OF SERVICE

- A. For projects involving installation of new water mains to replace existing water mains; and when subdivisions, businesses, residences, and similar entities are served from the existing water main that is being replaced; then the CONTRACTOR shall assume that the water main being replaced is the only means of servicing said subdivisions, businesses, and residences and that no alternative water source or backfeed is available to these said entities.
- B. It is the responsibility of the CONTRACTOR to schedule all Seminole County Utilities shut-downs in advance with Seminole County Environmental Services Department. Should the CONTRACTOR create an unscheduled interruption of utility service, then the CONTRACTOR shall be directly responsible for performing the necessary repairs in order to restore service. In addition, the CONTRACTOR shall be billed for subsequent repair work performed by Seminole County Utilities, and shall be held liable for any claims, penalties, or enforcement actions related to the service interruption.
- C. All scheduling of Seminole County Environmental Services Department's field personnel and scheduled temporary interruption of Seminole County Utilities service shall be made at least 72 hours in advance. CONTRACTOR shall schedule shut downs in advance by submittal of "Seminole County Construction Projects 72-Hour Request for System Shut Down" to the ENGINEER who will then notify the COUNTY and its associated Utilities personnel. The COUNTY reserves the right to approve or disapprove the said request.
- D. If the requested "System Shut Down" is approved by the COUNTY, then it shall be the responsibility of the CONTRACTOR to notify all affected customers that will experience a disruption in service. Notification shall indicate the date and time limits of the interruption and must be provided to affected customers in writing a minimum of 48 hours in advance while simultaneously providing two (2) duplicate copies of all said notifications to ENGINEER. In lieu of written notification and if approved by the COUNTY, CONTRACTOR may opt to install signage in the affected area indicating the same information stated above with the same time constraints applied.
- E. The COUNTY reserves the right to require the CONTRACTOR to perform utility "tie-ins" and "main flushing" during periods of low flow conditions in order to minimize service disruptions. "Tie-ins" and "main flushing" of this nature are typically required to begin no sooner than midnight and be completed no later than 5:30 a.m. "Tie-ins" of this nature that are required

by the COUNTY shall be performed by the CONTRACTOR at no additional cost to the COUNTY.

1.13 The requirements of the Utility Design ENGINEER OF RECORD may exceed the minimum technical requirements of Seminole County Environmental Services Department as depicted in the *Seminole County Land Development Code* including the "Water and Sewer Standards." In such instances, the more stringent requirement shall be observed. With respect to utilities, should a conflict exist within the Contract Documents, the more stringent requirements, as determined by the COUNTY through addendum, shall be observed during the preparation of bids. Subsequently, there shall be no increase in the cost for the labor, equipment, and materials associated with this item. Failure of the CONTRACTOR to request a determination of which requirements apply during bid preparation shall not be grounds for claims or additional compensation during construction if the COUNTY adopts the more stringent requirements.

1.14 For utility items not specifically covered by these Contract Documents, all construction shall be in accordance with the minimum technical standards as depicted in the latest copy of the *Seminole County Land Development Code* which includes the "Water and Sewer Standards." In the absence of a Technical Specification, use the applicable requirements of FDEP and the AWWA, both latest editions.

1.15 PROGRESS MEETINGS

The Engineer administering the contract or CEI shall schedule and hold regular monthly progress meetings. CONTRACTOR, Engineer, and all Subcontractors active on the site and any other interested parties at the direction of the Engineer administering the Contract shall be represented at each meeting. In addition, weekly on-site review meetings shall be held during construction at the discretion of the Engineer administering the Contract or CEI. CONTRACTOR, Engineer, and all Subcontractors active on the site shall be represented at each meeting. These weekly meetings will be used as a tool for pre-planning of work and enforcing schedules and for establishing procedures, responsibilities, identify party or parties responsible for follow-up on items. Revisit each pending item at each subsequent meeting until resolution is achieved. Such meetings are considered to be incidental to the work and no additional compensation is allowed.

1.16 REMOVAL OF EXISTING PAVEMENT, CURB, SIDEWALK

The CONTRACTOR shall not be allowed additional time, compensation, or claims for the cutting and removal of existing pavement, base, sub-base, or subgrade material, or concrete curbing or concrete sidewalk/driveways either

for the purpose of installing the utilities as shown on the Drawings, or for the purpose of furnishing and installing any temporary pavement or sidewalks during construction to maintain the flow of vehicular and pedestrian traffic during the installation of the utilities as shown on the Drawings. This type of work is considered to be incidental to the installation of the new utilities and the cost of any such work is to be included in the base unit price(s) for the utility to be installed. Similarly, any pavement, base, sub-base, subgrade material, concrete curbing, concrete sidewalk, or concrete driveway which is impacted during construction is to be restored to existing or better condition prior to final acceptance of the work. This work is also considered to be incidental to the installation of the utility and shall be included in the base unit price for the several items of work.

1.17 COORDINATION OF MAINTENANCE OF TRAFFIC

The CONTRACTOR is responsible for coordinating the construction of the utilities with the Maintenance of Traffic (MOT) plan for construction of the roadway and installation of the proposed storm sewer system. No additional compensation or time shall be allowed for this coordination or for any temporary utility construction or bypass systems necessary or required to complete the utility work as shown on the Drawings or as identified in the Specifications. The cost of this coordination, and for any temporary bypasses, shall be considered incidental to the cost of installation of the utility in question and shall be included in the base unit price for the several items of work.

1.16 DISCREPANCIES IN THE BID DOCUMENTS

- A. Whether a project is being administered primarily by Seminole County Environmental Services Department or another division within the COUNTY, it shall be the responsibility of the CONTRACTOR to alert the COUNTY in writing within 48 hours of discovery of any apparent discrepancies in the bid documents prior to submission of bids so that any required addendums can be issued to address these concerns. Given circumstances where it can be shown that a CONTRACTOR is aware of discrepancies in the bid documents and fails to formally alert the COUNTY in writing prior to the bid opening, CONTRACTOR shall not be permitted additional compensation to comply with the COUNTY and Utility Design ENGINEER OF RECORD'S intended requirements of the bid documents.
- B. Should a discrepancy in the bid documents be discovered by the CONTRACTOR after the bid opening, it shall be the responsibility of the CONTRACTOR to alert the ENGINEER in writing within 48 hours of the discovery of the discrepancy so that it can be addressed promptly to minimize impact on the project schedule. Failure of the CONTRACTOR to

follow procedure shall forfeit any and all possibility for the CONTRACTOR to request additional compensation and time for the completion of construction. Further, failure of the CONTRACTOR to provide written notification of the discrepancy to the ENGINEER shall be regarded as an attempt by the CONTRACTOR to create an intentional delay in the construction and no additional compensation shall be allowed.

END OF SECTION

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SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 TYPES OF SUBMITTALS

- A. Construction Schedules: The Contractor shall prepare and submit to the Owner and Engineer, prior to the Preconstruction Meeting, a construction schedule showing the proposed dates for starting and completing each of the various branches of work. The schedule shall be in the form of a CPM schedule with a representation of costs by months.
1. The Contractor shall provide monthly schedule updates and biweekly look ahead schedules.
 2. Construction schedule shall show proposed dates for submittals and their expected return dates.
 3. Construction schedule shall show proposed dates for road, sidewalk, and driveway closures.
- B. The Contractor shall submit a schedule of values within fifteen (15) calendar days after award of the Contract that meets the requirements of Section 01370.
- C. Manufacturer's data shall include all standard published information describing products, systems, methods and performance. Include manufacturer's name and address, and associations with which manufacturer of his products comply.
- D. Shop drawings and schedules shall include items, products, materials, methods, anchorages, details, or any other information required to fabricate items of the Work and complete the installation which is not specifically stated or described on manufacturer's data. Shop drawings shall specifically address the Work of this project.
- E. Installation instructions shall include all information required from a manufacturer or fabricator to have his product installed. This may be included as a shop drawing if such are required.
- F. Warranties and Guarantees required by the Contract Documents shall begin on the official date of acceptance of the project or any portion thereof, into which the warranted or guaranteed item was installed, constructed, or otherwise made operational. All warranties and guarantees shall be in effect for a minimum of two years unless specified for a longer period. Include all specific items covered, company names and addresses, and

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names of persons authorized to warrant or guarantee item(s) if not a blanket coverage.

- G. Certifications and test reports of products, materials, and performance for compliance with specified requirements shall specifically address the Work and shall contain the name or signature and address of persons authorized to make such certifications.
- H. Evidence of compliance to instructions shall be copies of transmittal letters or letter of verification duly signed by authorized persons.
- I. Operation and Maintenance Manuals shall include all literature required to properly operate and maintain any equipment installed in the Work and shall include names and addresses of manufacturers and authorized service and/or parts representatives, and dealers and shall be delivered on or before date of beneficial occupancy. Complete requirements of Operation and Maintenance Manuals are specified in Section 01700.
- J. Samples required shall be as specified and shall include identifications of the specific item and specification section to which the sample applies.

1.02 COPIES OF SUBMITTALS

- A. The minimum number of copies of submittals shall be submitted as follows and does not include numbers of copies required by the Contractor for his distribution or purposes.
 - 1. Manufacturer's data: 5
 - 2. Shop drawings and schedules: 5
 - 3. Schedule of values: 5
 - 4. Installation instructions: 5
 - 5. Warranties and Guarantees: 4
 - 6. Certifications and test reports: 5
 - 7. Evidences: 5
 - 8. Operation and Maintenance Manuals: 4
 - 9. Samples: 3
 - 10. Progress Schedule: 5 (initially)
 - 11. Restoration Plan/Schedule: 5 (initially)
- B. Any copies submitted in addition to those required will be processed and returned to the Contractor. Additional copies may be in the form of a reproducible copy.

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- C. Submittals received by the Engineer with less than the specified number of copies included will be immediately returned to the Contractor not reviewed and without action.
- D. As soon as practicable after the date of execution of the Owner/Contractor Agreement and within 60 days, the Contractor will make all required submittals.

1.03 REVIEW OF SUBMITTALS

- A. All submittals required by the Contract Documents shall be sent to the Engineer or the CEI administering the Contract.
- B. Copies of submittals to be returned for the Contractor's use will be processed and mailed to the Contractor within 14 days of receipt of each submittal by the Engineer.
- C. Review of submittals is only for conformance with the design concept of the project or Work and does not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents nor from responsibility for errors and omissions in the submittals.
- D. Submittals received without the Contractor's signed "Checked and Approved" stamp on each copy will be Returned Without Action (RWA) and noted as such.
- E. Any submittals or portions thereof not properly identified as to functions or specific items on the drawings and applicable specification section number will be returned without action (RWA) and noted as such.
- F. Any submittals or portions thereof which are processed and returned to the Contractor will be marked "No Exception Taken", "Revise and Resubmit", or "Rejected". A finding of "No Exceptions Taken" does not relieve the Contractor of the responsibility to ensure that the products submitted will meet the intent of the design.
- G. Submittals which refer to information or data not included in the submittal (excluding the Contract Documents) will not be checked.

1.04 WRITTEN DOCUMENTS

- A. All written documents including letters, letters of transmittal and request, generated by the Contractor shall be on standard letter or legal size paper and include Contractor name, the County's project name and number,

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Engineer's project number, date and must be signed by authorized personnel.

- B. Letters of transmittal whether written or of standard form, shall also clearly identify each part of the submittal with specification section number and drawing number and indicate the number of copies of each part. Letter requesting substitutions shall contain the same information.
- C. All submittals for approval shall be individually numbered by the Contractor in sequence of order of submission. Resubmittal of revised submittals shall bear the same numbers and be clearly marked Resubmittal No. ____.

1.05 COLORS

- A. The Engineer, in noting and marking submittals will use the color green.
- B. The Contractor, in noting and marking submittals shall use the color red.

1.06 ON-SITE RECORDS

- A. Contractor shall have at least one set of complete, approved submittals and shop drawings on the job site at all times when such work is in progress.

END OF SECTION

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SECTION 01370-SCHEDULE OF VALUES

PART 1 - GENERAL

A. Work Under This Contract

1. Submit to the Owner, within fifteen (15) calendar days after award of the Contract, a Schedule of Values allocating the basis for the costs for the various items of the Bid Form.
2. Upon request of the Owner or Engineer support the values with data that will substantiate their correctness.
3. The Schedule of Values, unless objected to by the Engineer or Owner, shall be used only as the basis for the Contractor's Applications for Payment.

B. Related Requirements

1. General and Special Conditions of the Contract.

C. Form and Content of Schedule of Values

1. Type schedule on 8-1/2 in. x 11 in. white paper; Contractor's standard forms and automated printout will be considered for approval by Engineer upon Contractor's request. Identify schedule with:
 - a. Title of Project and location.
 - b. Engineering and project number.
 - c. Name and address of Contractor.
 - d. Contract designation.
 - e. Date of Submission.
2. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.
3. For items in unit price contracts, follow the Bid Form, and provide a listing component parts.
 - a. List major components and their values. The sum of major component values will be equal to the Contract Price.

- b. As a part of each major component, list constituent parts products, operations and corresponding value. Identify the specification number and title. The sum of constituent parts value shall equal the major component value.

D. For the various portions of the work:

1. Each component or payment item shall include a directly proportional amount of the Contractor's overhead and profit.
2. For components or payment items on which progress payments will be requested for stored materials, break down the value into:
 - a. Cost of materials, delivered and stored with taxes paid, and
 - b. Installation and all other costs.
3. Submit sub-schedule for stored materials similar in format and parallel with other schedules.

END OF SECTION

SECTION 01380 - CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: Progress photographs shall be taken at periodic intervals, not to exceed 30 days, showing the extent and progress of the work performed as of that date. Photographs shall be taken at each location of work on the day ending period for which partial payment is requested during the development of stages and condition of work and as directed by the Engineer. Typical lift station and pipeline work shall be photographed at different stages of construction at the direction of the Engineer. Initial pre-construction photographs shall be taken no later than 14 calendar days after notice to proceed and prior to beginning of any construction, and shall show all views of the sites, including adjacent private property.

- A. Final Photographs shall be taken in the same manner and location as specified for Progress Photographs.
- B. At each specified time, take photographs of each major structure or area of work. Furnish 2 prints of each view.

1.02 QUALITY ASSURANCE

- A. Camera and Film: Use 35 mm camera with color film as approved by the Engineer.

1.03 SUBMITTALS

- A. Submit examples of photographer's work, similar to that required.
- B. Submit photographs with pay request for work photographed.
- C. Submit final binder at final closeout meeting.

1.04 NEGATIVES

- A. Negatives shall remain the property of Contractor. Maintain negatives for period of two years from Date of Substantial Completion of entire Project. Furnish additional prints during that time, to Owner and Engineer, at commercial rates applicable at time of purchase.

PART 2 - PRODUCTS

2.01 PRINTS

- A. Prints shall be 4" x 6" minimum, full color, matte finish.
- B. Mounting shall be pocket-type, plastic pages with 1 in. hinged binding edge. Submit photographs in plastic pages with pay request. Binder shall be hard cover, one for each set, size suitable to contain all photographs of project.

2.02 IDENTIFICATION

- A. Identify each print on back with:
 - 1. Name of project;
 - 2. Description of view;
 - 3. Time and date of exposure;
 - 4. Key plan, with location of camera and arrow to indicate the direction of view;
 - 5. Name and address of photographer, and
 - 6. Photographer's numbered identification of exposure.

PART 3 - EXECUTION

3.01 TECHNIQUE

- A. Factual presentation with correct exposure and focus for high resolution and sharpness with maximum depth-of-field and minimum distortion.

3.02 DELIVERY OF PRINTS

- A. Deliver prints monthly to accompany each request for progress payment. One set of prints each for:
 - 1. Engineer;
 - 2. Owner.

END OF SECTION

SECTION 01390 - AUDIO-VISUAL DOCUMENTATION

PART 1- GENERAL

1.01 SCOPE OF WORK

- A. Prior to commencing work, the Contractor shall have a continuous color audio-visual tape recording taken within the limits of the project to serve as a record of pre-construction conditions.

1.02 CONSTRUCTION SCHEDULE

- A. Tape recordings shall not be made more than 45 days prior to construction in any area. No construction shall begin prior to review and approval of the tapes covering the construction area by the Design Engineer. The Design Engineer shall have the authority to reject all or any portion of a videotape not confirming to specifications and order that it be redone at no additional charge. The Contractor shall reschedule unacceptable coverage within five days after being notified. The Design Engineer shall designate those areas, if any, to be omitted from or added to the audiovisual coverage. All tapes and written records shall become property of Owner.

1.03 PROFESSIONAL ELECTROGRAPHERS (VIDEOGRAPHERS)

- A. The Contractor shall engage the services of a professional electrographer. The color audio-visual tapes shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-visual tape documentation.

1.04 PRESENCE OF OWNER'S REPRESENTATIVE

- A. At the time of audio-visual documentation, an Owner's representative shall be present to witness the audio-visual documentation. It shall be the Contractor's responsibility to provide written notice at least ten (10) days in advance of the day that the documentation is to be performed. No audio-visual documentation will be accepted unless advance notice is provided to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The total audio-video system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project. The video portion of the recording shall produce bright, sharp, clear pictures with accurate colors and shall be free

from distortion, tearing, rolls or any other form of picture imperfection. All video recordings shall, by electronic means, display on the screen the time of day, and the month, day and year of the recording. This time and date information must be continuously and simultaneously generated with the actual recording. The audio portion of the recording shall produce the commentary of the camera operator with proper clarity and free from distortion.

- B. The recording system shall utilize EIA Standard Video and SNTSC compatible color (American TV Standard).

2.02 EQUIPMENT

- A. Camera - The color video camera used in the recording system shall have EIA Standard: NTSC type color - 1.0V 75 OHMS. Video output from camera (s) shall be capable of horizontal resolution of 350 lines at center and utilize a minimum of 8:1 Zoom with a 2/3 Newvicon tube for optimum color imagery plus minimum lag through one foot candle (10 Lux).
- B. Recorder - The recording shall be made with a VHS video-cassette recorder. The recorder shall record the color signal with a minimum horizontal resolution of 525 lines, 60 field, NTSC color signal, RF Modulated- 72dB.
- C. Video Tape Playback Compatibility - The recorded video tapes shall be compatible for playback with any American TV Standard VHS videocassette player.

PART 3 - EXECUTION

3.01 COVERAGE

- A. The recording shall contain coverage of all surface features located within the construction's zone of influence. The surface features within the construction's zone of influence shall include, but not be limited to, all roadways, pavement, detention ponds, walls, railroad tracks, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery, and fences. Of particular concern shall be the existence or non-existence of any faults, fractures or defects. Taped coverage shall be limited to one side of the street at any one time and shall include all surface conditions located within the zone of influence supported by appropriate audio description. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of the object.

3.02 AUDIO CONTENT

- A. Accompanying the video recording of each video tape shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the features being shown in the video portion of the recording. The audio recording shall also be free form any conversations between the camera operator and any other production technicians.
- B. Video Tape Log - Each video tape shall have a log of that video tape's contents. The log shall describe the various segments of coverage contained on the video tape in terms of the names of the streets or easement, coverage beginning and end, directions of coverage, video unit counter numbers, engineering stationing numbers and the date.

3.04 TIME OF EXECUTION

- A. Visibility - All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subject and to produce bright, sharp video recordings of those subjects. No taping shall be performed when more than 10 percent of the area to be taped contains debris or obstructions unless otherwise authorized by the Owner or Design Engineer.

3.05 CONTINUITY OF COVERAGE

- A. In order to increase the continuity of the coverage the coverage shall consist of a single continuous unedited recording which begins at one end of a particular construction area. However where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall consist of an organized interrelated sequence of recordings in various positions along that proposed construction area (e.g., wooded easement area). Such coverage shall be obtained by walking or by a special conveyance approved by the Owner or Design Engineer.

3.06 COVERAGE RATES

- A. The average rate of travel during a particular segment of coverage (e.g. coverage of one side of a street) shall be directly proportional to the number, size, and value of the surface features within the construction area's zone of influence.

3.07

CAMERA OPERATION

- A. Camera Height and Stability - When conventional wheeled vehicles are used as conveyances for the recording system, the vertical distance between the camera lens and the ground shall not exceed 10 feet. The camera shall be firmly mounted such that the transport of the camera during the recording process will not cause an unsteady picture.
- B. Camera Control - Camera pan, tilt, zoom-in and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video tape playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus shall be properly controlled or adjusted to maximize picture quality.
- C. Viewer Orientation Techniques - The audio and video portions of the recording shall maintain viewer orientation. To this end overall establishing views and visual displays of all visible house and business addresses shall be utilized. In easements where the proposed construction location will not be readily apparent to the tape viewer, highly visible yellow flags shall be placed, by the Contractor, in such fashion as to clearly indicate the proposed center line of construction.

3.08

SUBMITTALS – Three copies of the audio / visual tape shall be submitted to the Engineer prior to starting construction.

END OF SECTION

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. General provisions of Contract, including General and Special Procedures.
- B. Summary of Work - Section 01010.
- C. Submittal requirements - Section 01300.
- D. Operating and maintenance data - Section 01700.
- E. Record documents of materials - Section 01720.

1.02 SECTION INCLUDES

- A. Administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. Administrative and procedural requirements for handling requests for substitutions.
- C. Requirements for Product List submittal.

1.03 SUBSTITUTION REQUESTS

- A. Submit a separate request for each proposed substitution; 2 copies each on form bound into Project Manual. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.
 - 1. Designate Specification Section and Article number.
 - 2. Identify manufacturer by name and address, trade name, model number or catalog number.
 - 3. List product description, performance and test data, applicable reference standards, availability of maintenance service and source of replacement materials.
 - 4. Give itemized comparison of qualities of proposed substitution with specified product, changes required in other elements of the Work due to substitution and effect on Progress Schedule.

5. Give name and address of similar projects on which product was used and date of installation.
 6. Provide cost data comparing proposed substitution with specified product and state the amount of net change to Contract Sum.
- B. During Bidding period, times for submittal of substitution requests are stated in the Instructions to Bidders.
- C. After Bidding period, the Engineer will not consider any written requests from Contractor for proposed substitutions of products. Subsequent requests will be considered only in case of product unavailability or other condition beyond control of the Contractor.
- D. Do not order or install substitute products without written acceptance from the Engineer. Do not imply or indicate substitutions on shop drawings or product data submittals without a separate formal request.
- E. The Engineer will determine acceptability of substitution. Only one request for substitution for each product will be considered. If not accepted, Contractor shall provide specified product.
- F. Request for substitution constitutes a representation that the Contractor:
1. Has investigated the proposed product and determined that it is equal to or superior in all respects to the specified product.
 2. Will provide same or greater warranties for proposed product as for the specified product.
 3. Will coordinate installation of substitution accepted into the Work and make other changes and adjustments as may be required to make the Work complete in all respects.
 4. Waives all claims for additional costs due to substitution which may later become apparent.
 5. Agrees to reimburse the Owner for the additional service charges of the Engineer and their Consultants for evaluation and review of the proposed substitution and any additional engineering costs required to incorporate the proposed substitution.
 6. Will make all adjustments, changes, or additions as may be required to make the substituted material or utility perform according to the manufacturer's and the COUNTY's recommendations and requirements and to make the work complete and functional in all respects, at no additional cost to the COUNTY. Determination if work is complete and functional shall be at the COUNTY's discretion.

1.04 QUALITY ASSURANCE

- A. To the fullest extent possible, provide products of the same kind, from a single source.
- B. When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
 - 1. Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
 - 2. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
- D. The Contractor shall be responsible for the constructability and performance of any substitute materials requested by the Contractor and approved by the Engineer or by the County. The Contractor shall ensure that any approved substitute materials will perform to the intent of the specified materials, at no additional cost or time to the County, including the costs of installation, testing, repair, or correction of the utility system due to the performance or lack thereof of the substitute material.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- B. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
- C. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- D. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- E. Store heavy materials away from the project structure and existing structures in a manner that will not endanger the supporting construction.
- F. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

- A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
 2. Where available, provide standard products, which meet the specified requirements, of types that have been produced and used successfully in similar situations on other projects.
- B. Product selection is governed by the Contract Documents and governing regulations, not by previous project experience. Procedures governing product selection include the following:

1. Where only a single source product or manufacturer is named, provide the product indicated or submit a request for substitution for any product or manufacturer not named.
2. Where two or more sources of products or manufacturers are named, provide one of the products indicated or submit a request for substitution for any product or manufacturer not named.
3. Where Specifications describe a product or assembly, listing exact characteristics required, without use of a brand or trade name, provide any product or assembly that provides the characteristics and otherwise complies with Contract requirements.
4. Where Specifications require compliance with performance requirements, provide any products that comply with the specified requirements.
5. Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
6. Where Specifications require matching an established Sample, the Engineer's decision will be final on whether a proposed product matches satisfactorily.
7. Where specified product requirements are indicated to be selected from manufacturer's standard colors, patterns, textures, or similar condition, select a product and manufacturer that complies with other specified requirements. The Engineer will select the color, pattern and texture from the product line selected.
8. The description of specific qualities takes precedence over specified reference standards. The description of specific qualities and specified reference standards together take precedence over the named products of designated manufacturers.

C. Source Manufacturers:

1. Primary source products and manufacturers named in a Specification section are listed as standards of quality to which other products will be compared.
2. Source manufacturers named in a Specification section are those manufacturers considered capable of manufacturing products conforming to the specified requirements.
3. The naming of source manufacturers in addition to the primary source product and manufacturer specified does not imply acceptance or approval of just any standard product of that manufacturer. The standard products offered by a additional named source manufacturers shall be equal to or superior in every respect to the

specified or primary named source product and shall meet or exceed specification requirements.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTALLATION INSTRUCTIONS

- A. When Contract Documents require installation of work to comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to all parties involved in the installation, including copies to the Engineer in accordance with Section 01300.
- B. Handle, install, connect, condition, clean, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, notify Engineer for additional instructions.
- C. Do not omit preparatory steps or installation procedures unless specifically modified or exempted by Contract Documents.
- D. Do not proceed with work without clear instructions.

END OF SECTION

SUBSTITUTION REQUEST

PROJECT NAME: _____ DATE: _____
COUNTY PROJECT NUMBER: _____ FROM: _____

TO: Seminole County Environmental Services Department
500 West Lake Mary Blvd.
Sanford, Florida 32773

___ CONTRACTOR ___ BIDDER ___ SUPPLIER ___ MANUFACTURER

HEREBY REQUESTS ACCEPTANCE OF THE FOLLOWING PRODUCT OR SYSTEMS
AS A SUBSTITUTION IN ACCORD WITH PROVISIONS OF DIVISION ONE OF THE
SPECIFICATIONS:

1. SPECIFIED PRODUCT OR SYSTEM:
Generic Description:
Specification Section No. ____ Art. ____ Para.
2. SUPPORTING DATA:
____ Product data for proposed substitution is attached
(description of product, reference standards, performance
and test data).
3. ____ Sample attached. ____ Sample will be sent if requested.
PRODUCT OR SYSTEM QUALITY COMPARISON:

	SPECIFIED PRODUCT	SUBSTITUTION
Name, brand:	_____	_____
Catalog No.:	_____	
Manufacturer:	_____	
Vendor:	_____	
Significant variations:	_____	
Maintenance Service Available Locally:	___ Yes	___ No
If yes, location:		
Spare Parts Source:		

4. EFFECT OF SUBSTITUTION:
Affects other parts of work: ___ No ___ Yes

Explain:

Substitution changes Contract Time: Add/Deduct ____ days.

Saving or credit to Owner if accepted: \$_____.

Extra cost to Owner if accepted: \$_____.

5. PREVIOUS INSTALLATIONS:

Attach list of local similar projects on which proposed substitution was used and dates of installations.

6. STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT: I/we have investigated the proposed substitution and:

- a. believe that it is equal or superior in all respects to specified product, except as stated above; and
- b. will provide the same warranty as specified for specified product; and
- c. have included complete cost data and implications of the substitution; and
- d. will pay redesign and special inspection costs caused by the use of this product; and
- e. will pay additional costs to other contractors caused by the substitution; and
- f. will coordinate the incorporation of the proposed substitution in the Work; and
- g. will modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning; and
- h. waive future claims for added cost to Contract caused by the substitution; and
- i. agree to pay to the Owner or Engineer the hourly rate of Seventy Dollars (\$80.00) per hour for cost of Engineer to evaluate and review the proposed substitution.

Name and Title: _____ Date

Signature: _____

ENGINEER'S REVIEW AND ACTION:

__ Substitution not accepted:

__ Resubmit with additional information:

__ Substitution is accepted.

__ Substitution is accepted, with the following comments:

By: _____ Date: _____

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUBMITTALS

- A. All facilities to be owned or maintained by the County shall be located on County property, within County rights-of-way or in easement dedicated to the County for the uses intended. Proof of satisfactory completion of water and sewer facilities, satisfactory bacteriological tests, F.D.E.P. Certificates of Completion or Letter of Release, maintenance bonds, itemized construction costs, bills of sale, appropriate legal deeds and executed easements as well as record drawings shall be furnished to the County before final payment is made.
- B. Operating Manuals Data:
 - 1. The Contractor shall furnish to the Engineer required copies of all maintenance manuals, instruction books, parts lists, and installation drawings bound in ringed binders for plug valves and other mechanical equipment furnished under this contract. It shall be the Contractor's responsibility to satisfy the Owner's requirements regarding such data. Manuals, parts lists, etc. shall be presented to Owner at time of final inspection unless specifically requested earlier. All submittals shall be in a binder and neatly indexed and tabbed.
 - 2. Binder: The manuals shall be in 9-inch by 12-inch three-ring binders of a size to facilitate easy turning of the pages. The binders shall have a full size transparent built-in plastic pocket on the front to accommodate a label showing the name and location of the project, date of completion, Engineer name and contractor's name, address and phone number. On the binding edge the binders shall have a clip-on metal frame or built-in plastic pocket to accommodate a label showing the name and location of the project and the date of completion.
 - 3. Index: The Contractor shall furnish a neatly typed index in alphabetical or numerical order. Each major division shall list the equipment in alphabetical or numerical order. Listed under each of these major divisions shall be all items specified on the drawings as furnished with major items listed. These secondary items shall also be listed in alphabetical or numerical order. To the right of each of these equipment designations shall be the tab number under which the information can be found.

4. Tabs: Behind the index, provide numbered tabs beginning with one thru the number required for each type of equipment. Behind the tab, insert all shop drawings, shop-cuts, parts manuals, installation manuals and operation manuals associated with each item furnished. Only one tab will be required for each different material provided. The index designation shall refer to the tab number behind which the information on the equipment can be found.
- C. For utility systems being dedicated to or systems where the design and construction is paid for by the County, a two (2) year maintenance bond, or a Letter of Credit or similar instrument satisfactory to the County, equal to ten percent (10%) of the final utility construction costs shall be posted before Seminole County Utilities will recommend the facilities be accepted by the Board of County Commissioners. See Sections 35.44 and 40.36 of the *Land Development Code*.
- D. Release of Lien Statement:
1. The CONTRACTOR shall submit with his request for final payment sworn statements on the Owner's form from himself and each subcontractor, Material or Labor Supplier who has filed a "Notice to Owner" that all work has been completed and that all bills for labor, materials, and subcontractor's work on the project have been paid for in full.
- E. Record Drawings:
1. It is required that all utility line installations be field surveyed and record drawings be prepared from the survey data. The record drawings shall be signed and sealed by a State of Florida registered professional land surveyor who will be responsible for the accuracy of all dimensions and elevations in accordance with the "Minimum Technical Standards." Record drawings are required prior to final inspection of the project.
 2. At least four (4) complete sets of record drawings must be received by the County three (3) full working days prior to final inspection. The record drawings will be compared to the approved construction plans and shall be subject to field verification before final inspection of the project.
 3. Residential project dimensions are to be referenced from a permanent and easily recoverable physical monument (i.e., fire hydrant, property corner, street intersection, center line of road, etc.). Commercial projects shall be referenced from buildings and other pertinent structures.

- a. The horizontal location of new water mains, valves, blow offs, meters and/or meter boxes, manholes, force mains, lift stations and reclaimed water lines, and points of connection to existing water mains, force mains, manholes, lift stations, marker balls, and reclaimed water lines shall be referenced by distance to at least two permanent points.
 - b. The vertical location of new and points of connection to existing gravity sewer mains, reclaimed water mains and manholes, lift stations, water mains and force mains shall be referenced by distance to at least one permanent point.
 - c. The location of electronic marker balls installed during construction shall be noted on the record drawings by the symbol "EMB." Dimensions of the actual installed location of all utility lines constructed within an easement shall be shown on the record drawings.
4. Four (4) copies of a site survey of the approved lift station site, if applicable, must be received by the County. The survey shall be certified by a State of Florida registered professional land surveyor and include the legal description of the property.
 5. At least one copy of the project CAD file showing all improvements, including the lift station site survey, shall be provided to inspection after the final inspection and prior to acceptance by the Board of County Commissioners.

F. Final Inspection:

1. Final inspection will be held upon completion of the project. The Contractor shall notify the Owner, upon completion, to arrange an inspection tour of the completed project.
2. The Contractor, and the Owner's representatives shall be present for the inspection.

END OF SECTION

SECTION 01720 - RECORD DRAWINGS

PART 1 - GENERAL

1.01 DESCRIPTION: The Work covered under this section shall include furnishing the Engineer all information necessary for a complete set of Record Drawings.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS: The Record Drawings information shall be in strict accordance with the following codes and standards:

- A. Local county, municipal and utility codes
- B. Department of Environmental Protection (FDEP)
- C. Other sections of these specifications

1.03 MATERIALS: The Contractor shall mark on the construction drawings of the Contract Documents all field information.

PART 2 – RECORD DRAWINGS

The Contractor shall submit three (3) sets of certified Record Drawings and digital drawings either in AutoCAD (dwg) or Environmental Systems Research Institute (ESRI) (shapefile) format to the County, "Attention: Contracts Technician, Planning, Engineering and Inspection (PEI) Department", seven (7) full working days prior to final inspection. The Record Drawings will be compared to the approved construction plans and shall be subject to field verification before final inspection of the project. All Record Drawings shall be field verified, certified, signed and sealed by the Surveyor who will be responsible for the accuracy of all dimensions and elevations in accordance with the "Minimum Technical Standards". The Engineer of Record shall be responsible for recording information on the approved Plans concurrently with construction progress. Record Drawings submitted to the County as part of the project acceptance shall comply with the following requirements:

Drawings shall be legibly marked to reflect actual construction. All field changes not noted on the As-Builts/Record Drawings will be grounds for the rejection of As-Builts/Record Drawings.

Drawings shall show actual location and distances between all underground and above ground water, wastewater and reclaimed water

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pipng and related appurtenances. All changes to piping location including horizontal and vertical locations of utilities and appurtenances shall be clearly shown and referenced to permanent surface improvements such as edge of pavement etc. Drawings shall also show actual installed pipe material, class, etc.

Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.

Drawings shall clearly show all details not on original contract drawings but constructed in field. All equipment and piping relocation shall be clearly shown.

Location of all manholes, hydrants, valves, and valve boxes shall be shown. All water, sewer and reclaim devices shall be referenced from at least two preferably three permanent points. Dimensions between all manholes shall be field verified and shown. The inverts and rim elevations of all manholes shall be shown.

The X, Y and (Z) location based on the coordinate system Florida East Zone State Plane Coordinate Feet NAD 83, of all manholes(rim elevation), lift stations(rim elevation), cleanouts(grade), valves(center of pipe) and valve boxes(grade), hydrants(grade), blow offs(grade), sample points(grade) and meter boxes(grade) etc. shall be clearly shown. Acceptable position accuracy shall be sub-meter or better for compatibility with Global Positioning System (GPS) equipment.

Locations of all Electronic Location Ball (LB) devices shall be shown on the Record Drawings, labeled WLB, SLB and RLB for Water, Sewer and Reclaimed Water respectively.

Each sheet of the Plans shall be signed, sealed and dated by the Engineer of Record as being "Record Drawings". Construction Plans simply stamped "Record Drawings" and lacking in above requirements will not be accepted, and will be returned to the Engineer of Record. The "Certificate of Completion" will not be issued until correct "Record Drawings" have been submitted.

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PART 3 - EXECUTION

3.01 RECORDS: Daily records of changes in location of piping, fixtures and other items shall be kept and recorded on the record drawings. Seminole County Environmental Services Department requires that subsurface utility improvements have their physical locations surveyed the same day as they are installed (i.e., mains, valves, manholes, etc.). Surveyed locations and elevations are to be available upon request to the County and Engineer.

The Contractor shall review the completed record drawings and ascertain that all data furnished is accurate and truly represents the work actually installed. No Record Drawings information will be accepted from subcontractors.

3.02 SUBMITTAL: The project shall not be considered to be in substantial completion until record drawings have been submitted and accepted by the Engineer. Prior to final payment the record drawings shall be revised by the Contractor to reflect any changes which have occurred since the substantial completion submittal.

END OF SECTION

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SECTION 02104 - PROTECTION OF SHRUBS, TREES AND OTHER PLANTINGS

PART 1 - GENERAL

1.01 SCOPE: The Work under this section includes the furnishing of all labor, materials, tools and equipment necessary to properly preserve, protect and maintain trees, shrubs and other plantings adjacent to the work that are not to be removed.

1.02 APPLICABLE SECTIONS: For Sodding, see Section 02930.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PROTECTION OF EXISTING TREES AND SHRUBS:

- A. The Contractor shall enclose the trunks of trees adjacent to his work that are not to be removed. The Contractor shall protect them from injury from piled material, from equipment, from his operations, or other functions of Work. Excavating machinery and cranes shall be of suitable type and size and so operated with care to prevent injury to trees not to be removed especially to overhanging branches and limbs.
- B. Cutting of branches, limbs, and roots shall be subject to the approval of the Engineer, and shall be paid for by the Contractor. All cutting shall be smoothly and neatly done without splitting or crushing. In cases of cutting or unavoidable injury to branches, limbs, or trunks of trees, the cut or injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint. All tree trimming and cutting of trees are to be done by a qualified and approved tree surgeon and shall be paid for by the Contractor.
- C. Prior to commencing construction, the Contractor shall inform the private owners of shrubs, plants, etc. in the project area so that the owners of the affected shrubs, plants, etc., may remove them if they so desire; otherwise said plants and shrubs shall be removed by the Contractor, and shall be replanted or replaced in kind by the Contractor upon completion of construction at no additional cost.
- D. The Contractor will be required to replant or replace in kind any sod, shrubs, plants, etc., removed during construction. He will be required to block out sod in neat squares provided it is to be replanted within 48 hours, wrap root area of plants, shrubs, etc., with burlap bags, wet down and keep in good

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condition for replanting. The Contractor will also be required to replace the topsoil within the limit of the construction in non-pavement areas. Any sod removed and replanted shall be handled in accordance with Section 575 of the FDOT Specifications. See Section 02930: Sodding, for other requirements.

- E. The Contractor shall notify the Owner of the project at least two weeks prior to the beginning of construction so that he may remove any trees, shrubs, sod, etc., from the construction area.

END OF SECTION

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SECTION 02110 - CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 DESCRIPTION: Work under this section of the specifications consists of clearing and grubbing for the construction as shown on the plans, and the disposal of materials and debris resulting from the clearing and grubbing operations. The area of construction shall be cleared as required, subject to the approval of the Owner. The extent of clearing shall be minimized to the width required for installation of the work. The Contractor is expected to visit the sites of the work and determine for himself the extent of the clearing and grubbing necessary for his construction operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLEARING: Clearing only consists of the removal of all trees, living or dead, stumps, down timber, brush, rubbish and all other objectionable debris, from the area to be cleared. Trees, stumps and brush may be cut off flush with the surrounding ground surface or removed with a bulldozer at the option of the Contractor.

3.02 CLEARING AND GRUBBING: On areas specified to be cleared and grubbed, all trees, stumps, down timber, brush and other objects standing on or protruding from the ground shall be removed. All roots shall be grubbed and removed a minimum of 18 inches below the surface of the ground. Holes caused by grubbing operations shall be filled to the level of adjacent ground.

3.03 SELECTIVE CLEARING AND/OR GRUBBING: Special attention shall be given by the Contractor to saving, protecting and preserving any existing trees, shrubs or other vegetation so designated by the Engineer and/or Owner. The Owner or his representative will select and mark, or otherwise designate, trees, ornamentals or other vegetation to be preserved.

3.04 DISPOSAL: All material and debris resulting from clearing, or clearing and grubbing, operations shall be disposed of in a manner approved by the Engineer. It shall be the responsibility of the Contractor to obtain permits for hauling and disposal in areas where such permits are required and he shall be responsible for any and all damage to surrounding property or areas caused by his hauling operations.

3.05 CLEANUP: In accordance with the GENERAL CONDITIONS.

END OF SECTION

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SECTION 02140 - DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION: The Work to be performed under this section shall include furnishing all equipment and labor necessary to remove storm or subsurface waters from excavation areas in accordance with the requirements set forth and as shown on the drawings.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS: The dewatering of any excavation areas and the disposal of the water shall be in strict accordance with the latest revision of all local and state government rules and regulations. The Contractor shall obtain any required dewatering permit from the appropriate agencies prior to commencing dewatering operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DEWATERING: The Contractor shall provide adequate equipment for the removal of storm or subsurface waters which may accumulate in the excavation. If subsurface water is encountered, the Contractor shall utilize suitable equipment to adequately dewater the excavation so that it will be dry for work and pipe laying. A wellpoint system or other Engineer approved dewatering method shall be utilized if necessary to maintain the excavation in a dry condition for preparation of the trench bottom and for pipe laying. Dewatering by trench pumping will not be permitted if migration of fine grained natural material from bottom, side walls or bedding material will occur. In the event that satisfactory dewatering cannot be accomplished due to subsurface conditions or where dewatering could damage existing structures, the Contractor shall obtain the Engineer's approval of wet trench construction procedure before commencing construction. Dewatering shall cease in a manner to allow the subsurface water to slowly return to normal levels.

3.02 Dewatering equipment shall meet the following residential sound limits of 67 DB at 15 feet from dewatering equipment. The engine driven pumping equipment shall not be located within 25 feet of any residential unit.

3.03 DISPOSAL: Water pumped from the trench or other excavation shall be disposed of in storm sewers having adequate capacity, canals or suitable disposal pits. Contractor is responsible for acquiring all permits required to discharge the water and shall protect waterways from turbidity during the dewatering operation. In areas where adequate disposal sites are not available, partially backfilled trenches may be used for water disposal only when the Contractor's plan for trench disposal is approved in writing by the

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Engineer. The Contractor's plan shall include temporary culverts, barricades and other protective measures to prevent damage to property or injury to any person or persons. No flooding of streets, roadways, driveways or private property will be permitted. Engines driving dewatering pumps shall be equipped with residential type mufflers.

END OF SECTION

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SECTION 02150 - SHEETING AND SHORING

PART 1 - GENERAL

1.01 **SCOPE:** The work under this section includes the furnishing of all labor, materials, tools and equipment necessary to prevent cave-in of excavations and trench walls or settlement of areas adjacent to excavations and trench walls.

1.02 **GENERAL REQUIREMENTS:** The Contractor shall provide and install such sheeting and shoring as required to support the sides of any excavation to prevent earth movement that could endanger the work or workmen, or any existing structures, or to confine the construction within a specified area such as an easement or street right-of-way. Sheeting and shoring shall be used when the angle of repose for sloping of sides cannot be obtained. It shall be the Contractor's responsibility to place this sheeting and shoring for such protective purposes without the Owner's or Engineer's instructions. All sheeting placed below the crown elevation of pipe shall be left in place and trench backfilled in accordance with the applicable sections of the Specifications.

PART 2 - PRODUCT

2.01 MATERIALS

- A. Steel or wood sheeting may be used at the Contractor's option. Sheeting shall be of adequate strength for the purpose intended.
- B. Where conditions permit, steel drag shields or trench boxes may be used. Voids left by the advancement of the shield shall be carefully backfilled and compacted in accordance with trench backfill requirements.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall provide and install sheeting and shoring as necessary. Sheeting and shoring will be considered as being for Contractor's convenience and benefit, and all costs of furnishing, installing and removing same shall be borne by him. Sheeting may be timber or steel at the Contractor's option unless otherwise specified on the Contract Drawings or elsewhere in these specifications.

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- B. Steel sheeting above the crown elevation of pipe may be completely removed when sufficient backfill has been placed to prevent damage to the work and/or existing structures. Care shall be exercised to prevent the opening of voids during the extraction process. Unless otherwise directed by the Engineer, all timber sheeting shall be cut off thirty (30) inches below grade and left in place, with proper bracing to provide lateral support. All sheeting placed below the crown elevation of pipe shall be cut off above the pipe crown elevations and left in place. No payment will be made for sheeting or drag shields under this Contract. The cost therefore shall be merged with the cost of the items to which the sheeting or drag shields is incidental or appurtenant.

END OF SECTION

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SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subgrade for building slabs and walks.
- B. Excavation, fill, and backfill.

1.02 QUALITY ASSURANCE

- A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.03 PROJECT CONDITIONS

- A. Locate existing underground utilities in areas of work. Provide adequate means of support and protection during earthwork operations.
- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- C. Do not interrupt existing utilities serving occupied facilities.
- D. The use of explosives is not permitted.
- E. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory Soil Materials: ASTM D2487 soil classification groups GW, GP, GM, SM, SW and SP.
- B. Unsatisfactory Soil Materials: ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.

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- C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
- D. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 in. sieve and not more than 5 percent passing a No. 4 sieve.
- E. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2 in. in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Foundation Preparation Excavation:
 - 1. Excavate structure area extending at least one foot outside the perimeter of the wall footing limits down to 4 ft. below existing ground surface or 2 ft. below footing bottom whichever is lower.
 - 2. Compact excavation subgrade as specified. Perform field density tests and have subgrade approved before backfilling.
 - 3. Perform backfilling, compacting and testing of foundation excavation in incremental lifts to the level of the footings and slabs as specified.
- B. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- C. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction. Unauthorized excavation, as well as remedial work directed by Engineer, shall be at Contractor's expense.
- D. Additional Excavation:
 - 1. When unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Engineer.
 - 2. Removal of unsuitable material and its replacement as directed will be paid for in accordance with the lump sum contract price for sitework.

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E. Stability of Excavations:

1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction.
2. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
3. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

F. Shoring and Bracing:

1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

G. Dewatering:

1. Prevent surface water and subsurface or ground water from flowing into excavations.
2. Do not allow water to accumulate in excavations.
3. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
4. Draw groundwater table down at least one ft. below wetwell slab bottom excavation and maintain at least 2 ft. below the level of compaction of backfill material for wetwell or piping.
5. Draw groundwater table down to a level at least 6 ft. below existing ground surface to permit excavation and compaction of soils beneath wall, piping or equipment foundations. Maintain groundwater table at least 2 ft. below the level of compaction of excavation subgrade and backfill material.

H. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

I. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 ft., and extending a sufficient distance from footings and foundations to permit placing and removal of concrete form work, installation of services, other construction, and for inspection.

1. In excavating for footings and foundations, take care not to disturb bottom of excavation.

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2. Excavate by hand to final grade just before concrete reinforcement is placed.
3. Trim bottoms to required lines and grades to leave solid base to receive other work.

J. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide minimum 6 in. clearance on each side of pipe or conduit.

1. Excavate trenches to depth indicated or required for indicated flow lines and invert elevations.
2. Where rock is encountered, carry excavation 6 in. below scheduled elevation and backfill with a 6 in. layer of crushed stone or gravel prior to installation of pipe.
3. For pipes or conduit 5 in. or less, excavate to indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
4. For pipes or conduit 6 in. or larger, and other work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6 in. below bottom of work to be supported.
5. Except as otherwise indicated, excavate for exterior water-bearing piping so top of piping is minimum 3'0" below finished grade.
6. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
7. Backfill trenches with concrete where trench excavations pass within 18 in. of wall footings and which are carried below bottom of such footings, or which pass under wall footings.

K. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Engineer.

3.02 COMPACTION

A. Compact soil to the following percentages of maximum dry density relationship of the Modified Proctor, ASTM D1557.

1. Structures, Building Slabs and Pavements: Compact subgrade and each layer of backfill or fill material at 98 percent maximum dry density. Compaction shall be performed in 12 in. lifts.
2. Lawn or Unpaved Areas: Compact subgrade and each layer of backfill or fill material at 95 percent maximum dry density. Compaction shall be performed in 12 in. lifts.
3. Walkways: Compact subgrade and each layer of backfill or fill material at 95 percent maximum dry density. Compaction shall be performed in 12 in. lifts.

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- B. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3.03 BACKFILL AND FILL

- A. Place specified soil material in layers to required subgrade elevations:

1. In excavations, use satisfactory excavated or borrow material.
2. Under grassed areas, use satisfactory excavated or borrow material.
3. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both. Place shoulders along edges of subbase course to prevent lateral movement with satisfactory excavated or borrow material.
4. Under steps, use subbase material.
5. Under building slabs, use drainage fill material.
6. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 deg. of cylinder.

- B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including waterproofing and perimeter insulation.
2. Inspection, testing, approval, and recording locations of underground utilities. The Contractor shall provide a minimum of 48 hours notice to the Engineer prior to starting any backfilling or fill work that requires testing.
3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.

- C. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

- D. When existing ground surface has a density less than that specified for particular area classification, break up ground surface, pulverize, moisture--condition to optimum moisture content, and compact to required depth and percentage of maximum density.

- E. Place backfill and fill materials in layers of 8 in. loose depth for material compacted by heavy compaction equipment, (take care and necessary precautions not to cause settlement and/or damage to adjacent slabs,

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- walls, structures, etc.) and 4 in. in loose depth for material compacted by hand operated tampers.
- F. Contractor shall provide a minimum of forty-eight hours notice to the Engineer prior to starting any backfilling or fill work that requires testing.
 - G. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - H. Place backfill and fill materials evenly adjacent to structures, without wedging against structures or displacement of piping or conduit. Compaction equipment used within 10 ft. of buried walls and soil supported structures shall not exceed 2000 lbs.

3.04 GRADING

- A. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding and as follows:
 - 1. Finish to within not more than 0.10 ft. above or below required subgrade elevations.
 - 2. Walks: Shape surface to line, grade and cross-section, with finish surface not more than 0.10 ft. above or below required subgrade elevation.
 - 3. Pavements: Shape surface to line, grade and cross-section, with finish surface 1/2 in. above or below required subgrade elevation.
- B. Grading Surface of Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to 1/2 in. below required elevation.

3.05 FIELD QUALITY CONTROL

- A. The Owner will employ a testing laboratory to perform soil testing and inspection service for quality control testing during earthwork operations.
- B. If the test results indicate the material or equipment complies with the Contract Documents, the Owner shall pay for the cost of the testing laboratory. If the tests, and any subsequent retests, indicate the material and equipment fail to meet the requirements of the Contract Documents, the Contractor shall pay the laboratory costs incurred in such tests.
- C. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.

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D. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.

1. Paved Areas and Structure Slab Subgrade:
 - a. One field density test of subgrade for each 1000 sq. ft., minimum 2 tests.
 - b. One field density test for each layer compacted fill, for each 1000 sq. ft., minimum 2 tests each layer.

E. If in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed below specified density, provide additional compaction and testing at no additional expense to Owner.

3.06 CLEANING AND PROTECTION

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Remove excess excavated and waste materials, including unacceptable excavated material, trash and debris, and legally dispose of it off Owner's property.

END OF SECTION

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SECTION 02260 - FINISH GRADING

PART 1 - GENERAL

1.01 DESCRIPTION: To bring to finished elevations all earth materials as called for in drawings. This general work includes the completion of finish grading so that surfaces of compacted material are correctly oriented with the requirements of the slab or other component which will rest on the grade at that point.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. **Fill:** All fill shall be clean sand, free from debris, vegetable matter and other deleterious substances.
- B. **Topsoil:** All topsoil material on the site that is determined by the Engineer to be satisfactory for landscaping and/or grassing operations shall be stockpiled near the excavation limits for such use unless otherwise directed by the Engineer.

PART 3 - EXECUTION

3.01 GRADING: Fill, backfill and rough grade as necessary to bring entire site level with elevations of undersides of concrete slabs, walks, paving and finished landscaping as indicated on drawings or in specifications.

3.02 FINISH GRADING:

- A. Where elevations are indicated on plans, obtain such finish elevations, and establish uniform slopes of finish grades between indicated elevations.
- B. Where elevations are not indicated, establish and obtain uniform slope from finished spot elevations at the exterior face of the building out to the nearest indicated elevations for finished grades, as shown on plans.

END OF SECTION

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SECTION 02370-TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The work specified herein consists of designing, providing, maintaining and/or removing temporary erosion and sedimentation controls as necessary.
- B. Temporary erosion controls include, but are not limited to, sodding on-site surfaces and at those locations that will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the Engineer.
- C. Temporary sedimentation controls include, but are not limited to, silt fences and dams, traps, turbidity barriers, and appurtenances at the foot of sloped surfaces, which will ensure that sedimentation pollution, will be either eliminated or maintained within acceptable limits as established by the Engineer.
- D. Contractor is responsible for providing effective temporary erosion and sedimentation control measures during construction or until final controls become effective.

1.02 REFERENCES

- A. Codes, Specifications, and Standards:

Codes, Specifications, and Standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Latest revisions shall apply, unless otherwise shown or specified.

- B. Florida Department of Transportation (FDOT) Specifications:

- 1. Section 104 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.
- 2. Florida Department of Transportation Roadway and Traffic Design Standards, Indexes 100, 101, 102, 103, and 104.

1.03 SUBMITTALS: One (1) week prior to commencement of construction, Contractor shall submit to the Engineer his proposed plans and schedules for erosion and sedimentation control in writing.

PART 2 – PRODUCTS

2.01 EROSION CONTROL

- A. Sod - Bermuda grass, Argentine Bahia grass, Pensacola Bahia grass or St. Augustine.
- B. Netting - Polypropylene mesh netting 5/8 x 3/4-inch (16 x 19mm) mesh with interwoven curlex fibers as manufactured by American Excelsior Company or equal.

2.02 SEDIMENTATION CONTROL

- A. Bales - clean, seed-free cereal hay type.
- B. Sediment Control Fencing (Silt Fencing) - as manufactured by American Excelsior Company or equal.
- C. Filter stone - crushed stone conforming to Florida Department of Transportation Specifications.
- D. Concrete block - hollow, non-load bearing type.
- E. Concrete - exterior grade not less than 1-inch thick.
- F. Turbidity Barriers - floating or staked as required.

PART 3 - EXECUTION

3.01 EROSION CONTROL

A. Minimum Procedures:

1. Slopes greater than 3:1 shall be scarified or loosened to a depth of not less than 4 inches and then raked smooth of all debris larger than 1/2-inch diameter.
2. Sod shall be placed by hand within 24 hours after scarification of the soil.
3. Sod shall be placed with edges in close contact and joints staggered to avoid continuous seam line. The offset shall be a minimum of 6 inches.

3.02 SEDIMENTATION CONTROL: Install and maintain silt fences and dams, traps, turbidity barriers, and appurtenances as shown on the Drawings and as required by FDOT Standard Specifications for Road and Bridge Construction and FDOT Roadway and Traffic Design Standards for all construction. Hay bales that deteriorate and filter stone that dislodges shall be replaced.

3.03 PERFORMANCE: Should any of the temporary erosion and sedimentation control measures employed by the Contractor fail to produce results that comply with the requirements of the State of Florida, the Contractor shall immediately take whatever steps necessary to correct the deficiency at his own expense.

END OF SECTION

SECTION 02405 - HORIZONTAL DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 This section includes directional drilling, qualifications, pipeline material and fittings, installation and testing for HDPE Pipe.

1.02 RELATED SECTIONS

Section 02140 - Dewatering

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM) latest edition:

1. ASTM A307 - Carbon steel nuts and bolts
2. ASTM A536 - Ductile Iron Castings
3. ASTM D1248 - Polyethylene Plastics
4. ASTM D1784 - PVC Compounds
5. ASTM D1785 - Schedule 40, 80 and 120 plastic pipe
6. ASTM D3035 - Polyethylene Plastic Pipe Based on Controlled Outside Diameter
7. ASTM D3350 - Polyethylene Plastics Pipe and Fittings Materials
8. ASTM F1674 - Test Method for Joint Restraint Products for Use with PVC pipe.

1.04 SUBMITTALS

- A. Technical data for the equipment, method of installation, and proposed sequence of construction.
- B. Include information on how the bore is to be steered, the information recorded, and the certified as-built provided.
- C. Certification of pipe and fittings.

1.05 QUALIFICATIONS

The contractor shall provide work reference for which similar work has been conducted. A contact name and telephone number must be included for each reference. Conventional trenching experience or jack and bore experience will not be considered applicable.

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PART 2 PRODUCTS

2.01 BORING EQUIPMENT

Minimum 30,000 pound mechanical drilling rig controlling a boring head, assisted by and cooled by approved drilling fluid of low pressure and volume.

2.02 POLYETHYLENE PIPE AND FITTINGS

- A. AWWA C906 pipe 4 inches through 60 inches shall be color coded as specified in 2.05 of this Section. Stripes printed on the pipe outside surface shall not be acceptable. AWWA C906 pipe shall be as manufactured by PPI or equal. All pipe and fittings shall be designed and produced to ductile iron or C 900 diameters with uniform dimensions for outside diameter.
- B. Pipe installed within the bore hole shall be PE3408 High Density Polyethylene Pipe meeting cell classification 345434C or 345434E per ASTM D3350; meeting Type III, Class B or Class C, Category 5, Grade P34 per ASTM D1248; and shall be listed in the name of the pipe and fitting manufacturer in Plastic Pipe Institute TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings, Compounds, with a standard grade rating of 100 PSI at 73 degrees Fahrenheit. The manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.
- C. Polyethylene pipe shall be manufactured in accordance with ASTM F714, Polyethylene (PE) Plastic Pipe (DR-11.0/PR-100) or ASTM 3035, Polyethylene (PE) Plastic Pipe (DR-11.0/PR-100) based on controlled outside diameter and shall be so marked. Each production lot of pipe shall be tested for melt index, density, percent carbon, dimensions and either quick burst or ring tensile strength.
- D. Mechanical joint connections between ductile iron pipe or fittings and HDPE pipe or fittings shall use ductile iron mechanical joint glands conforming to AWWA C111 and AWWA C153. Mechanical joints shall be full thrust restrained. Gaskets, bolts and hexagonal nuts shall be standard rubber gaskets conforming to AWWA C111. Follower gland shall match Class 350 "compact" fittings.

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2.03

HEAT FUSION / BUTT FUSION

A. Fusion equipment specially designed for heat fusion of HDPE shall be used. The equipment utilized shall be regulated for the different melts strength materials. Compatibility fusion techniques shall be used when polyethylenes of different melt indexes are fused together. Use the following procedure to butt fuse HDPE pipe. If an operation contradicts manufacturer's directions, follow the manufacturer's recommendation.

1. Maintain the proper temperature of the heater plate as recommended by the pipe manufacturer. Check it with a tempilstik or pyrometer for correct surface temperature.
2. Clean pipe ends inside and outside with a clean cotton cloth to remove dirt, water, grease, and other foreign materials.
3. Square (face) the pipe ends using facing tools of the fusion machine. Remove all burrs, chips and fillings before joining pipe or fittings.
4. Check line-up of pipe ends in fusion machine to see that pipe ends meet squarely and completely over the entire surface to be fused. Make sure the clamps are tight so that the pipe does not slip during the fusion process.
5. Insert clean heater plate between aligned ends and bring ends firmly in contact with plate but do not apply pressure while achieving melt pattern. Allow pipe ends to heat and soften. Softening depths shall meet the manufacturer's recommendation.
6. Carefully move the pipe ends away from the heater plat and remove the plate (if the softened material sticks to the heater plate, discontinue the joint, clean heater plate, resquare pipe ends, and start over).
7. Bring melted end together rapidly. Do not slam. Apply enough pressure to form a double roll-back bead to the body of the pipe around the entire circumference of the pipe about 1/8-inch (3.175 mm) to 3/16-inch (4.763 mm) wide. Pressure is necessary to cause the heated material to flow together.
8. Allow the joint to cool and solidify properly. Remove the pipe from the clamps and inspect the joint appearance.

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- 2.04 HDPE may be jointed by Electrofusion coupling as manufactured by Central Plastics. All preapproved manufactures of the electrofusion couplings and fittings shall be an ISO 9001 certified company, with a complete line of materials.

2.05 PIPELINE IDENTIFICATION

- A. All polyethylene pipe shall be black, and shall contain a continuous colored stripe, 2 inches wide, at three separate locations along the length of the pipe. Stripe color shall be:

1. Potable Water Mains - blue stripes
2. Reclaimed Water Mains - purple stripes

2.06 SOURCE QUALITY CONTROL

The Manufacturer shall have manufacturing and quality control facilities capable of producing and assuring the quality of pipe and fitting required by these specifications. The Manufacturer's production facilities shall be open for inspection by the Owner or his authorized representative.

PART 3 EXECUTION

3.01 SITE VERIFICATION OF CONDITIONS

- A. Prior to all work in this section, carefully inspect the site and verify that there is access to the points where this installation may properly commence.
- B. Verify that all work can be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- C. Verify that there are no conflicts with existing utilities prior to the start of work.
- D. In the event of discrepancy, immediately notify the Engineer in writing.
- E. Deviations from the borepath due to underground obstructions will be discussed on-site with the Engineer and revised borepaths may be drilled based upon consent of the Engineer.
- F. Do not proceed with installation in the areas of the discrepancy until all such discrepancies have been fully resolved.

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3.02 DIRECTIONAL DRILLING

- A. The installation of pipeline by directional drilling shall be within the limits indicated on the Drawings.
- B. Directional drilling operations shall be conducted so that the depth at valves and crossings does not exceed 6 feet.
- B. Before directional drilling operation begins, depending on locations of drill rigs, cofferdams and dewatering shall be setup in accordance with Section 02240.
- C. Steering of the bore shall be conducted with a wire line guidance system, and the bore certified by a Professional Engineer licensed in the State of Florida. As-built variance from designed borepath shall not exceed +/- 0.5 feet in the vertical plane and +/- 2 feet in the horizontal plane. Contractor is responsible for providing the certified as-built information showing vertical depth to the centerline of the pipe at 10' intervals and any deviations in the horizontal plane measured from fixed objects.
- D. Boring shall be conducted using a mechanical boring head, assisted by and cooled by drilling fluid of low pressure and volume. Material Safety Data Sheets must be provided and approved by the Engineer for all drilling slurry compounds.
- E. Back reaming shall be conducted to enlarge and prepare the bore hole for pipe installation. Final back reamed diameter of the hole shall be 1.5 times the outside diameter of the pipe or larger.
- F. High density polyethylene pipe shall be heat fused and pressure tested as per manufacturer's guidelines before installation in the bore hole. During assembly and prior to pullback, pipe must be laid out in such a way as to minimize interference to pedestrian and vehicular traffic.
- G. Damage to the site will be restored to equal or better than pre-construction condition.
- H. Where construction activities are in close proximity to lakes, creeks, waterways or wetlands, silt fences will be used to protect the water from displaced soils, debris and other construction related materials.

3.03 DISPOSAL OF SURPLUS FLUIDS

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- A. All drill fluid excess should be contained in entry and/or exit pits and pumped as needed into additional on-site storage tanks, tanker trucks, vac trucks, etc. Contractor shall dispose of drill fluid excess to the satisfaction of the Owner and Engineer. After extraction drill fluids, pits and work areas are to be restored to equal or better condition than pre-construction condition.
- B. All material not needed or not suitable for backfilling over or around the entry and receiving pits shall be disposed by the Contractor at no extra charge. The disposal shall be subject to local codes and regulations.

3.04 SAFETY

- A. Comply with the following safety considerations to protect lives and property.
 - 1. Provide crew with safety vests to be worn at all times.
 - 2. Provide crew with safety equipment which will detect electrical current and voltage, with both visual and audible alarms, in the event of contact with electrical or telecommunication lines. Provide and use properly ground matting around the boring equipment. Provide insulated work boots and gloves.
 - 3. Notify affected homeowners or businesses before start of construction.

3.05 TESTING AND DISINFECTION

Test and disinfect pipeline in accordance with Section 02675.

END OF SECTION

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SECTION 02545 - CASING PIPE - JACK & BORE/OPEN CUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Furnish all material, equipment, transportation, tools, and labor to install casing pipe by jack and bore or open cut method, masonry plugs, casing spacers, sand fill and all related excavation, backfill, testing and other work for a complete job.

1.02 QUALITY ASSURANCE

- A. Pipe Inspection: The Contractor shall obtain from the casing manufacturers a certificate of inspection to the effect that the casings supplied for this Contract have been inspected at the plant and that they meet the requirements of these specifications. All casings shall be subjected to visual inspection at time of delivery by rail or truck, also just before they are lowered into the trench to be laid.

1.03 SUBMITTALS

- A. Certifications: Supplier of casing shall certify conformance to these specifications.
- B. Laying schedule including length, diameter and thickness of casing for each crossing.
- C. Casing spacers.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Steel casings shall conform to the requirements of ASTM Designation A139 (straight seam pipe only) Grade "B" with minimum yield strength of 35,000 psi. Pipe shall be seamless or have no more than one (1) longitudinal weld. Field and shop welds of the casing pipes shall conform to the American Welding Society (AWS) standard specifications. Field welds shall be complete penetration, single-bevel groove type joints. Welds shall be air tight and continuous over the entire circumference of the pipe and shall not increase the outside pipe diameter by more than 3/4-inch. A bituminous coating of coal tar varnish or asphalt base paint, one-mil thick shall be

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applied by the factory. The casing pipes shall have the minimum nominal diameter and wall thickness as shown on the following table:

CARRIER PIPE NOMINAL SIZE	CASING PIPE OUTSIDE DIAMETER INCHES	WALL THICKNESS INCHES
4	14	0.250
6	16	0.250
8	18	0.250
10	20	0.250
12	22	0.250
16	28	0.312
20	34	0.375
24	36	0.375

- B. Carrier Pipe Support: Carrier pipes inside of steel casing pipe shall be supported by casing spacers at no more than 10 feet between spacers but not more than manufacturer's recommendations. Each spacer shall be 12 inches wide and manufactured of minimum 14 gauge Type 304 steel or 14 gauge steel with fusion bonded PVC coating. Spacers shall be lined with a 90-mil PVC liner. All stainless nuts and bolts shall be corrosion resistant and compatible with the respective steel band. Each spacer shall have a minimum of 4 runner supports manufactured of a high molecular weight polymer plastic. The runner supports shall be of adequate height to position the carrier pipe in the center of casing with a minimum top clearance of 1/2 inch. All casing spacers larger than a 36-inch diameter (carrier pipe) shall be factory designed, taking into consideration the weight of the carrier pipe filled with water. All calculations and drawings shall be submitted to the Engineer for review. Casing spacers shall be manufactured by Advanced Products and Systems, Cascade Manufacturing, Pipeline Seal and Insulator or an approved equal

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- C. Pipe Handling: Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe or coatings. Pipe shall not be dropped. All piping shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe or coatings shall be repaired to the satisfaction of the County

PART 3 - EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. Work Coordination: It shall be the Contractor's responsibility to perform the boring and jacking work in strict conformance with the requirements of the agency in whose right of way or easement the work is being performed. Any special requirements of the agency such as insurance, maintenance of traffic, etc. shall be strictly adhered to during the performance of Work.
- B. Dewatering: Dewatering through the casing during construction shall not be permitted. All dewatering methods shall be approved by the County before construction work begins.
- C. Jacking Pit: Excavation adjacent to the roads shall be performed in a manner to adequately support the roads. Bracing, shoring, sheeting or other supports shall be installed as needed. Contractor install suitable reaction blocks for the jacks as required. Jacking operations shall be continuous and precautions shall be taken to avoid interruptions, which might cause the casing to "freeze" in place. Upon completion of jacking operations, the reaction blocks, braces, and all other associated construction materials shall be completely removed from the site.
- D. Miscellaneous Requirements: Correct line and grade shall be carefully maintained. Earth within the casing shall not be removed too close to the cutting edge in order to prevent the formation of voids outside the casing. If voids are formed, they shall be satisfactorily filled by pumping with grout.
- E. The sections of steel casing shall be field welded in accordance with the applicable portions of AWWA C206 and AWS D7.0 for field welded pipe joints. Contractor shall wire brush the welded joints and paint with Inertol Quick-Drying Primer 626 by Koppers Company or approved equal. After completion of jacking, Contractor shall clean the interior of the casing of all excess material.
- F. The ends of the casing shall be filled with concrete mortar or rubber type casing end seal, as manufactured by Cascade Waterworks Manufacturing,

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PSI Model C or Model W or approved equal.

- G. Casing Protection/Damage: Should the casing pipe be damaged, such damaged portion shall be removed and an alternate installation made after approval is obtained by the Owner.
- H. Open Cut: Correct line and grade shall be carefully maintained. Add-on sections of casing pipe shall be full-ring welded to the preceding length, developing watertight total pipe strength joints. Following placement of the casing pipe, masonry plugs shall be installed at each open end. Said plugs shall be suitable for restraining the external earth load, while allowing internal drainage.

END OF SECTION

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SECTION 02570 - PAVEMENT AND CONCRETE REPLACEMENT

PART 1 - GENERAL

- 1.01 **DESCRIPTION OF WORK:** The work under this section includes constructing or replacing asphaltic concrete pavement or concrete sidewalks and driveways as shown on the Drawings or disturbed as a result of construction.
- 1.02 **QUALITY ASSURANCE**
- A. Codes and Standards: Comply with applicable sections of FDOT Specifications and local governing regulations.
 - B. The mixture, placement, and curing of all paving and concrete work shall be in accordance to FDOT Specifications.
- 1.03 **SUBMITTALS:** Furnish manufacturer's product data, design mixes, test reports, and materials certifications.
- 1.04 **JOB CONDITIONS**
- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities, as specified under Section 00920, paragraph 1.07.
 - B. Utilize flagman, barricades, warning signs and warning lights as required.
- 1.05 **RESTORATION:** All surfaces shall be completed as soon as possible. In no case shall the replacement operation be unfinished for more than two weeks after backfilling unless otherwise directed by the Engineer. Replace all damaged or cut pavement due to Contractor's operations; restore all pavement outside of trench area that is damaged by the Contractor at no expense to the Owner.
- 1.06 **GUARANTEE:** All restored areas within the public right-of-way shall be guaranteed for two years. In the event of settlement of paved areas more than 1/4 inch below the undisturbed adjacent permanent pavement, the Contractor shall make the necessary repairs to restore the pavement level within ten calendar days after notification by the Owner. The cost of such repairs shall be paid by the Contractor.

PART 2 - PRODUCTS

2.01 BASEROCK: Limerock, shellrock and local rock shall conform to FDOT Specifications, Section 911.

2.02 ASPHALTIC CONCRETE

- A. Prime and Tack Coats: Prime and tack coats shall be applied to the prepared baserock. Prime coat shall be cutback asphalt, Grade RC-70, MC-30 or MC-70, complying with FDOT Specifications, Articles 300-1 through 300-7, applied at the average rate of 0.15 gallon per sq yd.

Tack coat shall be emulsified asphalt, Grade RS-2, complying with FDOT Specifications, Articles 300-1 through 300-7 respectively, and applied at the average rate of 0.10 gallon per sq yd. The bituminous quantities are considered as average and are subject to some variation at the discretion of the Engineer and at no additional cost.

- B. Plant Mix Wearing Surface: A plant mix wearing surface course shall be constructed on the prepared limerock base. Materials and construction shall conform to the requirements of FDOT Standard Specifications for Type II modified "Asphaltic Concrete Surface Course", Section 332, Article 332-1 through 332-4. The finished pavement replacement shall be smooth and even with, or slightly above, the existing abutting pavement, but shall not have any appreciable bump due to this slight elevation.

- C. Rock, Gravel or Marl Replacement: Roads, streets or driveways constructed of rock, gravel or marl shall be restored to a condition equal to or better than prior to construction.

2.03 CONCRETE MATERIALS

- A. Forms: Steel or wood for each type of use of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radius bends as required.
2. Coat forms with a non-staining form release agent that will not discolor or deface the surface of the concrete.

- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, AASHTO M55 (ASTM A185).

- C. Concrete Materials: Comply with requirements of FDOT Section 345 for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- D. Epoxy Resin Grout: Type N as specified in FDOT Section 926.
- E. Aggregate, brick or other material required to match existing driveway or walk shall be as approved by the Engineer.

2.04 CONCRETE MIX, DESIGN AND TESTING

- A. Comply with requirements of applicable FDOT Section 345 for concrete mix design, sampling and testing, and quality control, and as herein specified.
- B. Design the mix to produce standard weight concrete consisting of portland cement, aggregate, air-entraining admixture and water to produce the following properties.
 - 1. Compressive Strength - Class B, 3,000 psi for walks and curbs.
 - 2. Compressive Strength - Class A, 4,000 psi for driveways.
 - 3. Air Content: 3% to 6%
- C. Concrete placement slump shall not exceed plus or minus 1 inch from approved design slump.

PART 3 - EXECUTION

- 3.01 PAVEMENT REPLACEMENT: Replace pavement in accordance with the details shown on Drawings. The baserock shall be placed and compacted in accordance with the FDOT Specifications, Section 200. Application of the tack coat shall follow the application of the prime coat immediately prior to the placing of the wearing surface course.
- 3.02 EDGE TRIMMING: Trim edges of the existing pavement with a concrete saw or other approved method to provide a clean, straight edge.
- 3.03 PAVEMENT MARKINGS: Repaint, stripe or otherwise mark pavement to match pre-existing conditions, using FDOT approved materials and procedures.

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3.04 SIDEWALK, CONCRETE DRIVEWAY, CURB AND GUTTER REMOVAL AND REPLACEMENT

A. Surface Preparation:

1. Remove loose material from the compacted subbase surface immediately before placing concrete.
2. Proof-roll prepared subbase surface to check for unstable areas and the need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving. Comply with requirements of FDOT Section 230, paragraph 230-6.

B. Form Construction:

1. Set forms to the required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of the work and so that forms can remain in place at least 24 hours after concrete placement.
2. Check completed formwork for grade alignment to the following tolerances:
 - a. Top of forms not more than 1/8 inch in 10 feet.
 - b. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
3. Clean forms for reuse immediately after use, and coat with form release agent as often as required to ensure separation from concrete without damage.

C. Concrete Placement:

1. Do not place concrete until subbase and forms have been checked for line and grade. Moisten if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are completed to required finish elevation and alignment. Use special colors or aggregate as required to match existing material.
2. Place concrete using methods which prevent segregation of the mix. Consolidate concrete along the face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation.

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Consolidate with care to prevent dislocation of reinforcing, dowels and joint devices. Do not use vibrators to push or move concrete in forms or chute.

3. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
4. Curbs and Gutters: Automatic machine may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results which meet or exceed the minimum herein specified. Machine placement must produce curbs and gutters to the required cross-section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.
5. Joints: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
 - a. Weakened-Plan Joints: Proved weakened-plane (contraction) joints sectioning concrete into areas as shown on the drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, by sawing within 24 hours of placement or formed during finishing operations. Place joints at intervals not to exceed 10 feet if not otherwise indicated.
 - b. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such pours terminate at expansion joints. Construction joints shall be as shown or, if not shown, use standard metal keyway-section form of appropriate height.

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c. Expansion Joints:

- (1) Provide premolded joint filler for expansion joints abutting concrete curbs, catch basin, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
- (2) Locate expansion joints at 30 feet o.c. for concrete walks unless otherwise indicated.
- (3) Extend joint fillers full-width and depth of joint, and not less than 1/2 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- (4) Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Pieces shorter than 4 inches shall not be used unless specifically shown as such.
- (5) Protect the top edge of the joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- (6) Fillers and Sealants: Comply with the requirements of these specifications for preparation of joints, materials installations, and performance, and as herein specified.

D. Concrete Finishing:

1. After striking-off and consolidating concrete, smooth the surface by screening and floating. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture.
2. After floating, test surface for trueness with a 20-foot straightedge. Variations exceeding 1/3 inch for any two points within 10 feet shall not be acceptable. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
3. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.
4. After completion of floating and when excess moisture or surface sheen has disappeared broom finish sidewalks by drawing a fine-hair

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broom across concrete surface, perpendicular to a line of pedestrian traffic. If existing material has another finish, match existing finish.

5. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas.
- E. CURING: Protect and cure finished concrete paving and walks, complying with applicable requirements of FDOT Section 350. Use moist-curing methods for initial curing whenever possible of approved concrete curing compounds.
- F. Repairs and Protections:
1. Repair or replace broken or defective concrete, as directed by Engineer.
 2. Drill test cores where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy resin grout.
 3. Protect concrete from damage until acceptance of work. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
 4. Sweep concrete pavement and wash free of stains and discolorations, dirt and other foreign material just prior to final inspection.

3.05 FIELD QUALITY CONTROL

- A. General: Repair or remove and replace unacceptable asphalt or concrete paving, sidewalk or curb and gutter as directed by the Engineer.
- B. Thickness: In-place compacted asphalt thickness will not be acceptable if exceeding following allowable variation from required thickness.
1. Base Course - 1/2 inch, less than specified.
 2. Surface course - 1/4 inch, more than specified.
- C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10 foot minimum straightedge applied parallel with, and at right angles to direction of paved area. Surface will not be acceptable if exceeding the following tolerances for smoothness.

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1. Wearing Course Surface - 3/16 inch noncumulative.
- D. Surface Elevation: Actual surface elevations shall be within ± 0.05 feet of specified or indicated elevations at any given point. Surface elevations between any two given points shall be interpolated from a direct line between the two points. Pavement exceeding actual elevation tolerances of more than 0.05 feet at any two points within a distance of 15 feet will not be acceptable.
 - E. Testing: Bearing value samples and core samples will be obtained and tested by the County's approved testing laboratory for approximately each 100 square yards of asphalt and concrete pavement area, as directed by the Engineer. Any rework resulting from any test revealing construction not to be within the limits stated herein, or by FDOT standards, will be performed immediately upon notification of the Engineer.
 - F. If the test results indicate the material or equipment complies with the Contract Documents, the Owner shall pay for the cost of the testing laboratory. If the tests, and any subsequent retests, indicate the material and equipment fail to meet the requirements of the Contract Documents, the Contractor shall pay the laboratory costs incurred in such tests.

END OF SECTION

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SECTION 02600 - PIPE AND FITTINGS FOR POTABLE WATER

PART 1 - GENERAL

- 1.01 **DESCRIPTION OF WORK:** Work under this section consists of furnishing all materials, supplies, equipment and labor in accordance with the requirements set forth herein and as shown on the drawings for furnishing and installing water pipe and appurtenances.
- 1.02 **APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:** The Work under this Contract shall be in strict accordance with the following codes and standards.
- A. Local, county and municipal codes.
 - B. American Society for Testing and Materials (ASTM).
 - C. American National Standards Institute (ANSI).
 - D. American Water Works Association (AWWA).
 - E. American Association of State Highway and Transportation Officials (AASHTO).
 - F. Florida Department of Transportation Specifications (FDOT).
 - G. Florida Department of Environmental Protection (FDEP)
 - H. Federal Specifications.
 - I. National Sanitation Foundation (NSF).
 - J. United States Department of Commerce Commercial Standards (CS).
 - K. All local government rules and regulations.
- 1.03 **SUBMITTALS**
- A. **Manufacturer's Data:** Prior to delivery, submit manufacturer's descriptive literature, catalog cut sheets, technical data and any other necessary information to show proposed products conform with the contract documents.
 - B. **Shop Drawings:** The Contractor shall submit shop drawings for all equipment and materials to Seminole County Environmental Services

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Department. Include details of pipe and fitting products, pipeline drawings, laying schedules, underground structures, connections, restraints, and anchors. At a minimum product shall meet Seminole County Water and Sewer Standards as contained in the Land Development Code.

- C Certifications: The Contractor shall submit a certification from the pipe manufacturer that the pipe and fittings supplied have been inspected at the plant and meet these specifications and all applicable standards. All lined pipe shall be certified by an independent testing laboratory; and meets all requirements of these specifications. Contractor shall provide certification that PVC pipe bears National Sanitation Foundation seal of approval for potable water pipe.

1.04 MATERIALS AND EQUIPMENT

- A. Unless otherwise specified or shown on the drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.

1.05 WORKMANSHIP

- A. All materials and equipment shall be installed in accordance with the manufacturer's instructions and to these Contract Documents. The Contractor shall notify the Engineer when the manufacturer's instructions conflict with these specifications.

1.06 SITE MAINTENANCE

- A. The Contractor shall take the necessary steps to prevent objectionable blowing or drifting of dust, sand or other debris where the construction occurs in residential, commercial or other developed areas.

1.07 STORAGE OF MATERIALS AND EQUIPMENT

- A. The Contractor shall provide space for storage of materials and equipment. Pipe strung along roads and right-of-ways shall be placed in a manner that will not endanger or restrict pedestrian or vehicular traffic.

1.08 OPEN TRENCH

- A. The amount of open trench shall be limited so that no more than 100 feet of open trench in advance of the backfilling operation will remain at the end of the working day. All open trench shall be protected by the Contractor with barriers, warning devices and traffic control devices, which shall be kept in the correct position, properly directed and clearly visible at all times. The barrier, warning and traffic control devices shall be suitably lighted at all times that vehicular traffic lights are required.

1.09 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of water, materials and products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with water piping work similar to that required for project.
- C. Codes and Standards:
 - 1. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of water system materials and products.
 - 2. Water Purveyor Compliance: Comply with requirements of Purveyor supplying water to project, obtain required permits and inspections.

PART 2 - PRODUCTS - WATER PRESSURE MAINS

2.01 PIPE AND PIPE FITTING

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities as indicated.
 - 1. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in potable water systems.
 - 2. Where more than one type of materials or products is indicated, selection at a minimum shall meet Seminole County's "Water & Sewer Standards" as contained in the *Land Development Code*.
- B. Pipe Fittings and Accessories: Same material and weight/class as pipes, with joining method as indicated.

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C. Copper Tube: ASTM B 88; Type K, soft-annealed temper; wrought copper solder joint fittings, ANSI B16.22; lead-free soldered joints.

D. PVC Pipe for Water Main Applications

1. Polyvinyl Chloride (PVC) Pipe: All pipe shall conform to ASTM D1784 and shall be made from virgin resin compounds. Pipe 4-inches through 12-inches shall be AWWA C900, DR 18, pressure class 150, and meet all the requirements of the AWWA C900 standard, latest edition. Pipe 14-inches and greater shall be AWWA C905 with a dimension ratio of DR-18 and pressure rated at 165 psi, and shall meet all of the requirements of the AWWA C905 standard, latest edition. All PVC pipe 4-inches and greater shall have push-on joints using elastomeric gaskets conforming to the requirements of ASTM F477. Source Manufacturers for PVC pipe: Certainteed, Cantex, Northstar, Johns-Manville, IPEX, H& W and HEP.

All PVC pipe must bear the NSF logo for potable water use.

2. Restrained Joints: The pipe restraint shall be provided by restraining sufficient length of pipe as shown on the drawings. Mechanical restraint devices for PVC pipe shall meet the following requirements listed in paragraphs a. and b. below.

- a. Push-On Pipe Joints: Restraining devices shall consist of two split rings, restraining rods, and related hardware. The split rings shall be manufactured of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a safety factor of two and shall comply with the requirements of UNI-B-13-92. The devices shall be Series 1390 as manufactured by Uni-Flange, Meg-a-Lug, Romac Industries 600 Series, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 09900, and shall be wrapped with polyethylene which meets the requirements of, and is installed in accordance with AWWA C105.

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- b. Mechanical Joint Fittings: Where PVC pipe connects to mechanical joint ductile iron fittings and joints are to be restrained, restraining device shall consist of a split ring, restraining rods, and related hardware. The split ring shall be constructed of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a factor of safety of two and shall comply with the requirements of Uni-Flange B-13-92. The devices shall be Series 1390 as manufactured by Uni-Flange, Meg-a-Lug, Romac Industries 600 Series, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 00990, and shall be wrapped with polyethylene meeting the requirements of, and is installed in accordance with AWWA C105."
 - c. It shall be the responsibility of the Contractor to restrain any existing pipe systems that are connected to newly constructed pipe system. Restraint shall be installed in accordance with the applicable restrained joint table detailed on the Drawings. The cost of these restraints shall be included in the cost of bid items included in the Contract Documents and no additional compensation shall be allowed.
- E. Polyvinyl Chloride (PVC) Pipe: ASTM D 1785, Schedule 40 for sizes ½ inch. through 3 inch.; PVC fittings, Schedule 40 socket type, elastomeric gasketed joints or solvent weld joints.
 - F. Polyethylene (PE) Pipe: AWWA C901 for sizes ½ inch through 3 inch.
 - G. Ductile Iron Pipe and Fittings of Water Main Applications

Ductile Iron Pipe: Pipe shall meet ANSI/AWWA C151/A21.51 latest edition, with cement mortar lining and asphaltic seal coat complying with ANSI 21.4/AWWA C104. Pipe 4" to 12" shall have a minimum pressure Class 350 psi. Pipe 14" to 20" shall have a minimum pressure Class 250 psi. Pipe 24" and larger shall have a minimum pressure Class 200 psi. Pipes 30" and larger shall be pressure Class 150 psi. Fittings shall be push-on mechanical joint, or flanged ductile iron fittings conforming to ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, or ANSI/AWWA C153/A21.53 with

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cement mortar lining and asphaltic seal coat, or all fittings, under this section, shall be supplied with a fusion applied epoxy coating, both inside and outside for total protection. The epoxy coating system used shall be suited for potable water contact and protection in wastewater applications for sewer gases. The epoxy coating system must have NSF 61 certification and be recognized and certified by the manufacturer as approved for use in both potable water and wastewater application with total protection. The epoxy coating shall meet or exceed ANSI/AWWA C-550 and C116/A21.116 requirements. Nominal coating and lining thickness shall be 6 to 8 mils dry film thickness. The coating and lining system shall be applied for secure adhesion and shall have a smooth surface. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111. Source manufacturers for pipe and fittings shall be: American, McWane, Star Pipe Products, U.S. Pipe, Griffin, Clow, Fabricators Inc. Novo Pipe SP-2000W and Tyler.

It shall be the responsibility of the Contractor to restrain any existing pipe systems that are connected to newly constructed pipe system. Restraint shall be installed in accordance with the applicable restrained joint table detailed on the Drawings.

2. Joints:

- a. Joints for buried ductile iron pipe shall be push-on or mechanical joints conforming to ANSI/AWWA C111/A21.11.
- b. Joints for exposed pipe above ground or in vaults shall be flanged conforming to ANSI/AWWA C111/A21.11 and ANSI B16.1, 125 lb.
- c. Use restrained joints at all locations where unbalanced reactions occur. Thrust Blocks are not allowed. Approved restrained joints for ductile iron pipe include factory restrained joints or mechanical restraining devices. Factory restrained joints may include Flex-Ring Joint, Lok-Ring or Fast Grip by American Cast Iron Pipe, TR-Flex or Uniflex Joints by U.S. Pipe and Foundry, or an approved equal. Mechanical restraint devices include Megalug restrainer glands by EBAA Iron for mechanical joints, Series 1300 by Uni-Flange for mechanical joints, Series 1390 by Uni-Flange for push-on joints, Star Pipe Products series 3000, 3100 and 3600, Series

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611 by Romac Industries for push-on bell and spigot joints, Series 612 by Romac Industries for mechanical joints, or an approved equal.

Welded-on-Outlets: Ductile iron pipe with welded-on outlets shall be American Ductile Iron Pipe specials or an approved equal. The outlets shall be fabricated from centrifugally cast ductile iron pipe, manufactured and tested in accordance with ANSI/AWWA C151/A21.51. The welded-on pipe outlet shall be assembled to the parent pipe at the pipe factory. No field welded-on outlets will be accepted. Outlets shall have a rated working pressure of 250 psi and shall have a cement mortar lining in accordance with ANSI/AWWA C104/A21.4. Acceptable outlet types may include flanged joints ANSI/AWWA C110/A21.10 or C115/A21.15, or mechanical joints, ANSI/AWWA C111/A21.11

3. Coatings and Linings:

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA C104/a21.4. Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer. Intermediate and finished field coats of Alkyd shall also be applied by the Contractor (minimum 1.5 mils dry thickness each coat). Primer and field coats shall be compatible and shall be applied in accordance with the manufacturer recommendations. (See approved manufacturers' list in appendix.) Final field coat shall be dark blue for raw water and blue for finished water.

All ductile iron pipe and fittings shall have an interior protective lining of cement-mortar with a seal coat of asphaltic material in accordance with ANSI/AWWA A21.4/C104.

4. Fittings:

Fittings shall be push-on mechanical joint, or flanged ductile iron fittings conforming to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 with cement mortar lining and asphaltic seal coat or all fittings, under this section, shall be supplied with a fusion applied epoxy coating, both inside and outside for total protection. The epoxy coating system used shall be suited for potable water contact and protection in wastewater applications for sewer gases. The epoxy coating system must have NSF 61 certification and be

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recognized and certified by the manufacturer as approved for use in both potable water and wastewater application with total protection. The epoxy coating shall meet or exceed ANSI/AWWA C-550 and C116/A21.116 requirements. Nominal coating and lining thickness shall be 6 to 8 mils dry film thickness. The coating and lining system shall be applied for secure adhesion and shall have a smooth surface. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111. Source manufacturers for pipe and fittings shall be: American, McWane Star Pipe Products and U.S. Pipe.

5. Fasteners:

Provide studs, bolts, nuts and washers in quantities required to fully assemble all piping and accessories. Fasteners for flanges joints shall be AISI Type 316 stainless steel conforming to ASTM F 593 and ASTM F 594 for all exterior flanged piping. Fasteners for mechanical joints shall be high strength, low alloy steel having the characteristics listed in Table 6 of AWWA C111.

H. Miscellaneous Fittings and Accessories:

1. Flanged Adapter: Cast iron, ASTM A126, Class B, Flanges to match ANSI B 16.1, 125 lb. flanges.
2. Wall Sleeves:
 - a. Cast iron or hot dip galvanized steel with exterior ring cast at center of sleeve.
 - b. Mechanical Joint: Acceptable Figure No. F-1436, Clow Corporation, or equal.
3. Penetration Seals: Where pipes pass through walls and sleeves, pipe-to-wall penetration closures shall be furnished.
 - a. Interlocking synthetic rubber links assemblies with austenitic stainless steel bolts and nuts.
 - b. Glass fiber reinforced plastic pressure plates under each bolt head and nut.
 - c. For Piping 10" and Larger: Links shall have reinforced centering blocks in the lower 90° quadrant or assembly.

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- d. Acceptable: Link-Seal by Thunderline Corporation, Wayne, Michigan, or equal.
- 4. Threaded Pipe Nipples: Short lengths unless otherwise required. Close lengths shall not be used except with special permission of the Engineer. Nipple stock shall be of same material used in connecting pipe and shall conform with material specifications.
- 5. D.I.P. Couplings: Couplings shall be full-circle, Rockwell, Dresser. Unless otherwise indicated, couplings 2 inches and smaller shall be malleable iron and couplings over 2 inches shall be cast iron.
- 6. PVC Adapters and Flexible Couplings: Prefabricated polyvinyl joint sealer adapters and couplers are manufactured by Fernco or equal, with stainless steel bands and adjusting screws.

I. Service Pipe, Stops, Fittings and Service Saddles

a. Service Pipe

All service lines shall be 1 1/2" or 2" polyethylene tubing, and shall be high-density polyethylene pipe, 3408 CTS, only. All service tubing shall comply or exceed the applicable standards of ASTM D1248, ASTM D3350, ASTM D2239, ASTM D2737, NSF-14 and AWWA C901. The cell classification for tubing shall be 345444E (exterior) and 345444D (interior). All potable water line tubing shall be blue in color with a clear virgin high-density polyethylene center, which the manufacturer shall furnish a certificate of purity. The tubing shall have UV protection and shall not be affected by direct sun light for up to a minimum of four years. Tubing shall have a minimum pressure rating of 200 psi with a SDR of 9 (CTS). Size range for potable water tubing shall be 1 1/2 inch to 2 inch and shall come with a lifetime warranty; Potable water tubing shall be ENDOT Endro Pure or approved Equal.

All reclaimed water tubing shall be high-density polyethylene pipe, 3408 CTS, only. All reclaimed service tubing shall comply or exceed the applicable standards of ASTM D1248, ASTM D3350, ASTM D2239, NSF-14, ASTM D2737, and AWWA C901. The cell classification for tubing shall be 345444E (exterior) and 345444D (interior). Tubing shall have a minimum pressure rating of 200 psi and SDR of 9 (CTS). Reclaimed tubing shall be pantone 522C in color with a clear virgin high-density polyethylene center, which the manufacturer shall furnish a certificate of purity, and shall come with a lifetime warranty. The tubing shall have UV protection and shall not be affected by direct sun light for up to a minimum of four years. All reclaimed tubing shall be ENDOT or approved equal.

b. Stops

Corporation stops shall be 1" or 1-1/2" brass, equipped with connections compatible with the polyethylene tubing and threaded in accordance with specifications in AWWA C800. Curb stops shall be sized to match the meter size and conform to the specifications in AWWA C800.

Water services that are two inches (2") in diameter shall be connected to the water main by a tapping saddle and valve w/valve box. A close brass nipple shall be used between the saddle and valve.

c. Fittings

Fittings shall be brass, cast and machined in accordance with specifications in AWWA C800 and AWWA C901, with compatible polyethylene tubing connections.

d. Service Saddles

A service saddle shall be used for all service line taps. Service saddles shall be single or double strapped epoxy coated with stainless steel bands and bolts. Ford FC-101, F202 or approved equal. Service saddles for PVC pipe shall have the double strap sized exactly to the pipe outside diameter. Sealing gaskets shall be BUNA-N rubber and straps shall be corrosion resistant alloy steel.

The County will require a stainless steel strap and fusion epoxy or nylon coated ductile iron body with stainless steel hardware in areas designated as corrosive.

e. HDPE Electrofusion Bonded Service Taps

HDPE electrofusion bonded taps shall comply with all requirements of NSF-14 and shall have ISO 9001 certification. All taps shall be rated for the same working pressure as the water main pipe being used. Electrofusion tapping tee and couplings shall provide 360 degree fusion of the pipe for a monolithic connection, and shall be as manufactured by Central Plastics. Installation shall be in strict compliance with manufacturer's requirements.

PART 3 - SYSTEM INSTALLATION

3.01 EXCAVATION: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as necessary. This shall include all necessary clearing and grubbing of any foreign substance encountered within the structure or trench area. Excavated material suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to prevent slides or cave-ins. All applicable provisions of Section 02200: Earthwork shall be followed.

- A. Protection of Existing Facilities and Utilities: All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury and, in case of damage, they shall be restored by the Contractor without compensation. Known existing utilities and other underground obstructions are shown on the plans, but the accuracy of the locations and depths is not guaranteed. The Contractor shall contact the utility prior to construction and arrange for the necessary assistance in locating and protecting the existing utilities. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition.
- B. Trench Excavation: The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 in. each side of pipe for unsheeted or sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus 24 in., unless otherwise shown on the drawings. Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface the trench walls shall be as vertical as possible under soil conditions.

No more than 100 linear feet of trench shall be open in advance of the completed pipe laying operation without prior approval of the Engineer. Pipe trenches across roadways and driveways shall be backfilled as soon as pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority. No trench shall be left open across any roadway or driveway for more than 24 hours.

- C. Shoring, Sheet piling and Bracing: The Contractor shall do all shoring, sheet piling and bracing or provide other approved facilities required to perform and protect the excavation and as necessary for the safety of the public, the employees, and the preservation of existing roads, structures and other utilities. The top of such sheet piling left in place shall be cut off at a minimum elevation of 2.5 ft below finished grade.

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- D. Pavement Removal: The Contractor shall remove pavements as part of the trench excavation. The material from permanent pavement removal shall be carefully separated from trench excavation material and disposed of by the Contractor as approved by the Engineer.
- E. Boulder Removal: All rocks, stones, boulders or concrete, having any dimension larger than permitted to be used for backfill in the paragraph entitled "Backfilling" of these specifications, shall be removed from the site and disposed of by the Contractor.
- F. Disposal of Excess Materials: The Contractor shall dispose of the excavated materials not required or suitable for backfill. All surplus excavated material which is suitable for fill shall become property of the Contractor, and shall be disposed of by the Contractor at his expense.
- G. Unstable Soil Conditions and Overdepth Excavation: Where unstable soil conditions are encountered, the excavation shall be increased as directed by the Engineer. The bottom of the excavation shall be brought up to the proper excavation elevation utilizing suitable and properly compacted backfill material.

3.02 INSTALLATION OF MAINS: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturer's instructions and with the applicable AWWA or ASTM Standards. If a conflict exists between the manufacturer's instructions and the AWWA or ASTM Standards, the manufacturer's instructions shall govern.

The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless wet trench installation is approved by the Engineer.

- A. Depth of Cover: Unless otherwise shown on the drawings, or otherwise authorized by the Engineer, the pipe shall have a minimum cover of 36 in.
- B. Connections to Existing Mains: The Contractor shall make connections to existing mains as shown on the drawings. Connections to pressurized mains shall be made only after flushing has been completed and under the system Owner's immediate supervision.

3.03 SEPERATION OF NON-POTABLE AND POTABLE WATER LINES

A. Horizontal Separation

- 1. Whenever possible, existing and proposed water and sewer lines (sanitary and storm) shall be separated at least 6 feet horizontally.

Horizontal separation between water and reclaimed water lines shall be 5 feet.

2. Should local conditions prevail which would prevent the 6-ft and 5-ft minimum specified separation, installation at closer horizontal separations will only be allowed provided that the water mains is installed in a separate trench or on an undisturbed earth bench located to one side of the sewer at such an elevation that the bottom of the water main is at least 12 inches above the top of the sewer.
3. There shall be at least a 6-foot horizontal separation between water mains and sanitary sewer force mains. Installation at closer horizontal separations is not allowed unless it has been specifically detailed on construction drawings that have been approved under the FDEP permit.
4. Under no circumstances shall pipe separation be less than 3 feet.

B. Vertical Separation

1. Parallel Lines

Whenever potable (water) and non potable lines (reclaimed, sanitary, storm, force mains) run parallel and do not meet the horizontal separation requirements, then the lines shall be vertically separated with the potable line at least 12 inches above the top of the non - potable lines.

2. Crossings

- a. Water mains crossing sewers or force mains shall be installed to provide a minimum vertical distance of 12 inches measured from the outside of the water main to the outside of the sewer or force main. The water main may be either above or below the sewer or force main at crossing. The constructed pipeline shall be installed so that the pipeline joints are as far from the crossing as possible.
- b. Vertical separation at crossing between water mains and sewer mains (sanitary and storm) may be reduced from 12 inches to 6 inches provided one of the following conditions is met:
 - 1) The sewer pipeline material is either C900 / C905 DR 18 PVC or Pressure Class 350 ductile iron and the pipe is pressure tested; or

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- 2) The sewer is encased in concrete ($f'c = 2500\text{psi}$) so that the encasement extends beyond the first sewer pipeline joint in each direction (Generally, a distance of 10 feet each side of the crossing).
- c. Vertical separation at crossings between water mains and sewer force mains may not be less than 12 inches unless it has been approved under the FDEP permit.

3.04 BACKFILLING

- A. Material: Shall be excavated material, essentially free of organic material, asphaltic concrete, clay, concrete, boulders and other deleterious material.
 1. Bedding and Pipe Embedment: The material in the bedding, around the pipe and to a depth of 1 foot over the pipe shall be sand or a mixture of sand, shell or crushed rock properly graded and mixed so that fine grain material from the side walls of the trench or backfill above the embedment will not migrate into the backfill material. The backfill shall meet the following limitations:
 - a. Ductile Pipe - All material shall pass through a 3/4 inch square opening laboratory sieve.
 - b. Plastic Pipe - All material shall pass through a 1/2 inch square opening laboratory sieve for pressure water mains.
 2. Above Pipe Embedment: The material shall be sand or a mixture of sandy material and rock, stone and shell. Rock, stone and shell shall pass through a 3-1/2 inch ring.
 3. Additional Fill: If sufficient suitable backfill material is not available from the excavation, additional fill meeting the above requirements shall be provided by the Contractor at no additional expense to the Owner.
- B. Placing and Compaction:
 1. Pressure Mains
 - a. Under Pavement: Where the excavation is made through existing or proposed pavements, including shoulders, curbs, driveways or sidewalks, or where such structures are penetrated by wellpoints, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks passing a 3-1/2 in. ring will be permitted in the backfill between the elevation one foot above the top of the pipe and the bottom of the pavement subgrade.

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The entire backfill material, including the material placed around and one foot above the pipe, shall be compacted to a density of not less than 100% of the maximum density, as determined by AASHTO T-99. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.

Roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock, or a conglomerate of such materials are not considered as being permanent pavement.

- b. In Areas Not Under Permanent Pavement: Within right-of-ways or other areas where permanent pavement does not exist or is not proposed, including roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock or conglomerate, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks having a dimension of 6 in. will be permitted in the backfill between the elevation 1 ft. above the top of the pipe and 1 ft. below the surface. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. The bedding and embedment shall be compacted to a density of not less than 100 percent of maximum as determined by AASHTO T-99. The backfill material above 1 ft. over the pipe shall be compacted to a density of not less than 98 percent of the maximum density, as determined by AASHTO T-99. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.
- c. Miscellaneous: Backfilling around meter boxes, valve boxes and other structures shall be accomplished in the same manner as the connected pipe. Extreme care shall be used in backfilling wellpoint holes should be plugged with a concrete slurry, such plugging to be at the expense of the Contractor.
- d. Compaction Tests: The Engineer may at any time instruct the Contractor to partially excavate a previously backfilled trench or temporarily backfilling of a short section of the trench for the purpose of obtaining measurements of the density of the backfill. The testing will be paid for by the Owner. The cost of the partial excavation and restoration of the backfill will be paid by the Contractor. Density tests shall be taken along the pipe. (Maximum distance between tests shall be 300 lineal feet.

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Tests shall begin 12" from top of pipe and shall be tested every 24" in depth for subsequent lifts).

- 3.05 **CULVERT REPAIR:** Culverts, catch basins, swales and other drainage structures that are damaged during construction shall be replaced with materials and structures equal and similar to those removed or damaged, unless indicated otherwise. Manhole covers and gratings shall be set at the original elevations unless otherwise directed. In addition, it shall be the responsibility of the Contractor to maintain existing drainage patterns and stormwater conveyance systems throughout the duration of the project.

The Contractor shall take precautions against the entry of excavated and other loose material resulting from his operations from entering catch basins, culverts and other drainage structures in the vicinity of his operations. He shall maintain the cleanliness of these drainage structures in a condition equal to that prior to the commencement of his operations during the construction. The Contractor shall be responsible for all damage to persons, roads, buildings, vehicles and other property resulting from the failure of the Contractor to maintain these drainage structures. The cost of repair of any culverts shall be borne by the Contractor.

- 3.06 **RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY:** Where pavement, trees, shrubbery, fences or other property and surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before Work began within a time frame approved by the Engineer.
- 3.07 **PROTECTION:** At the end of each workday the mains under construction shall be plugged to prevent the entry of small animals or rodents. Temporary plugs shall be provided by the Contractor for this purpose.
- 3.08 **CLEANUP:** The Contractor shall maintain the site of the Work in a neat condition. The Contractor shall remove all excess materials, excess excavated materials and all debris resulting from his operations within a time frame approved by the Engineer.
- 3.09 **PRESSURE TESTING, FLUSHING, AND DISINFECTION:** See Section 02675

END OF SECTION

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SECTION 02640 - VALVES, FIRE HYDRANTS, AND ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: The Contractor shall furnish and install all valving equipment as shown on the Drawings and as specified.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS: The Work under this Contract shall be in strict accordance with the following codes and standards:

- A. Local, County and Municipal Codes
- B. American Society for Testing and Materials (ASTM)
- C. American National Standards Institute (ANSI)
- D. American Water Works Association Standards (AWWA)
- E. Florida Department of Transportation Specifications (FDOT)
- F. Federal Specifications
- G. United States Department of Commerce Commercial Standards (CS)
- H. All Local Government Rules and Regulations

1.03 MATERIALS AND EQUIPMENT

- A. Unless otherwise specified or shown on the Drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.
- B. Prior to the start of the Work, the Contractor shall submit a list of the manufacturers of all equipment and materials to be incorporated in the work that conform to a standard, code or as specified.
- C. Provide valves meeting the following requirements: (1) Connections fitting the joints specified, indicated and/or required for the piping; (2) Rated for not less than 150 psi cold water, non-shock service, unless specified otherwise herein; and (3) Turn to the left to open. Provide valve boxes with all buried valves. Submit complete valve schedule showing type, use and location, with valve shop drawings, for approval before installation.

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PART 2 - PRODUCTS

2.01 VALVE OPERATORS

A. General: The rated torque capability of each operator, shall be sufficient to seat, unseat and rigidly hold in any intermediate position the valve disc or plug it controls under the test conditions specified. All valves shall be equipped with adjustable mechanical stop-limiting devices to prevent over-travel of the valve disc or plug in the open and closed positions. Operator housings, supports and connections to the valve shall be designed with a minimum safety factor of five based on the ultimate strength, or based on three on the yield strength of materials used. The rated torque capability of each cylinder portion of a cylinder operator shall be sufficient to seat, unseat and rigidly hold in any intermediate position the valve disc or plug it controls under the operating conditions specified. Operators to be buried shall be watertight. The position of the operator shall be as shown on the shop drawings. The piece mark of the valves, the location, the size, the type of operator, the maximum working head, and the closing time shall be tabulated on the shop drawings.

B. Gearing: All gear operators or traveling-nut operators shall be self-locking and designed to transmit twice the required operator torque without damage to the faces of the gear teeth or the contact faces of the screw or nut. Upon request, the manufacturer shall furnish the purchaser with certified copies of reports describing the procedures and results of the tests for each model and torque rating of operator to be furnished.

Operators composed of worm gearing shall be totally enclosed in a lubricant gear case and shall have worm gears of bronze and worms of hardened steel that operate.

Operators of the traveling-nut type shall have threaded reach rods of steel and shall have a bronze or ductile iron nut with internal threads. Operators shall be enclosed.

C. Manual Operators: Manual operator shall have all gearing totally enclosed. Operators shall be designed to produce the specified torque with a maximum pull of 80 lbs on hand wheel or chain wheel operators and a maximum input of 150 ft-lb on operating nuts. Stop-limiting devices shall be provided in the operators for the open and closed position. All operator components between the input and these stops shall be designed to withstand, without damage, a pull of 200 lbs for hand wheel or chain wheel operators and an input torque of 300 ft-lb for operating nuts. An arrow and the word "open" or "close" shall be cast on the hand wheel to indicate the direction to turn said hand wheel. All operating nuts shall be designed so that counter clockwise movement of the hand wheel will open the valve and clockwise movement of the hand wheel will close the valve.

2.02 RESILIENT SEAT GATE VALVES

A. General

All gate valves shall be resilient seat gate valves. Such valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C515, latest revision, and in accordance with the following Specifications. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.

B. Materials / Requirements

- The resilient-seated gate valve shall consist of an encapsulated disc with elastomeric seat which, in the closed position effects a seal upon a ductile iron body resulting in a bubble tight seal across this disc at a full differential of 200 psi. This shall be accomplished by means of a corrosion resistant threaded bronze stem, acting through a bronze stem nut, fixed into the disc in such a way as to force the disc seat into the body, effecting a seal when the stem is torqued in the desired direction.
- Each valve shall be tested from both directions, by the manufacturer, for bubble tight, 200 psi differential sealing ability. Each valve shall also be tested in the "disc up" position at 400 psi resulting in a full shell test. There shall be no leakage at any of the valve's joints or connections.
- All internal parts shall be accessible without removing the main body from the pressure line.
- All ductile iron internal surfaces of the body shall be coated completely with corrosion resistant coating. For potable water applications, coating shall comply with requirements of NSF 61 and be accepted by FDEP.
- The internal diameter of the water passageway shall be at least as large as the connecting pipe inside diameter.

All valves' interior and exterior surfaces shall be coated with a high performance, one-part, heat-curable, thermosetting epoxy coating which provides superior corrosion resistance protection for metal parts. For potable water applications, coating shall comply with requirements of NSF 61 and be accepted by FDEP.

C. Resilient Wedge Gate Valve

Valves shall be American Flow Control's series 2500 Ductile iron Resilient Wedge Gate Valves.

Valves shall be Resilient Wedge type rated for 250 p.s.i. cold water working pressure. Valve body, bonnet, wedge and operating nut shall be constructed of ductile iron. The exterior of the ductile iron wedge shall be fully encapsulated with rubber.

The wedge shall be symmetrical and seal equally well with flow in either direction.

Operating nut shall be constructed of ductile iron and shall have four flats at stem connection to assure even input torque to the stem.

All gaskets shall be pressured energized O-rings. Stem shall be three O-rings.

The top two o-rings shall be replaceable with valve fully open and while subject to full rated working pressure. O-rings set in a cartridge shall not be allowed.

Valve shall have thrust washers located with one (1) above and one (1) below the thrust collar to assure trouble-free operation of the valve.

All internal and external surfaces of the valve body and bonnet shall have a fusion bonded epoxy coating, complying with ANSI/AWWA C550, applied electrostatically prior to assembly.

2.03 PLUG VALVES

- A. Plug valves except as noted shall be of the non-lubricated, eccentric type with resilient faced plugs, and screwed, flanged, or mechanical joint ends as shown on the Drawings. All plug valves shall provide drip-tight shutoff up to the full pressure rating of the valve with pressure in either direction. Port areas of four (4) inch to twenty (20) inch valves shall be at least one hundred (100) percent of full pipe area and port opening shall be full round. Bodies shall be semi-steel with raised seats and easily replaceable. Valves shall be rated at 175 psi min. bubble tight in either direction. Seats in three (3) inch and larger valves shall have a welded-in overlay of not less than ninety percent pure nickel on all surfaces contacting the plug face. Valves through twenty (20) inches shall have a stainless steel permanently lubricated upper and lower plug stem bushings. All valves four (4) inches

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and larger shall be of the bolted bonnet design. Packing on all valves shall be adjustable. All exposed nuts, bolts, springs and washers shall be zinc plated. Means of actuation shall be by lever, gear actuator, tee wrench, extension stem, above ground operator, floorstand, etc., as indicated on the Drawings or by the Engineer. Flanged valves shall be faced and drilled to ANSI 125 Standard. Flanges of valves through twelve (12) inches shall have face-to-face dimensions of standard gate valves. All plug valves shall be as manufactured by DeZURIK Model 118; Kennedy Model 40-A; M&H Model 820; Val-Matic, Cam Centric; Clow, Ful-Flo; or equal.

- B. All buried plug valves 6 inches and larger shall be equipped with gear actuators. Gearing shall be enclosed in semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts. Actuator shaft and quadrant shall be supported on permanently lubricated bronze bearings. Mounting brackets shall be totally enclosed with gasket seals. Exposed nuts, bolts, springs and washers shall be stainless. Actuator shall be furnished by the valve manufacturer.
- C. Plug valves shall be wrench operated with 2-inch operating nut, except where, due to lack of space for the wrench, or where the valve centerline is more than 5'-0" above the floor, they shall be either worm gear or spur gear operated and have wheel and chain where necessary.
- D. Unless otherwise specified or approved, a suitable wrench shall be provided for each four (4) wrench-operated valves and at least one (1) for each operating station. Wrenches or wheels and chains shall be of suitable size and sufficient length for easy operation of the valves at their rated working pressure.
- E. Plug valves shall be coated with a high-performance, one-part, heat-curable, thermosetting epoxy coating which provides superior corrosion resistance protection for metal parts.

2.04 HOSE BIBBS

- A. Hose bibbs shall be Crane No. 58 of the size shown on the Drawings.

2.05 BALL VALVES

- A. Water Service: Ball valves shall be designed for a water working pressure of not less than 150 psi, shall be constructed of PVC and when in the fully-open position, shall have a port diameter not less than Schedule 80 PVC pipe of the same nominal diameter. Valves shall be designed with true union ends to permit removal of the valve from the line and with end connectors designed for solvent welding to the pipe. Acceptable: ASAHI Duo-Bloc, Chemitrol or equal.

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2.06 AIR RELEASE/VACUUM RELEASE VALVES

A. Below Grade ARV

On water mains the use of fire hydrants and blow offs are the preferred method of air release.

The valve body shall be of Cast Iron ASTM A126 B; the floats, float guide and stem shall be of stainless steel Type 304. The resilient seat shall be of Buna N. The valve shall be rated for 150 psi working pressure. Valve shall have standard two (2) inch NPT inlets and outlet ports unless otherwise shown on the Drawings. A connection shall be provided for back-flushing the valve. All connection and back-flushing valves shall be operated by a stainless steel or bronze handle.

All potable water, reclaimed water, and sanitary force mains shall have air and vacuum release valves installed as they are indicated on the Drawings. The body/base of these valves shall be made from high strength lightweight non-corroding fiberglass reinforced nylon, and all operating parts are to be made of engineered corrosion resistance plastic materials. The rolling resilient seal shall provide smooth positive opening, closing, and leak free sealing over the fluctuation of pressure differentials. The valve shall be designed to allow larger than normal automatic orifice providing efficient air release and minimize potential debris build up and clogging. The working pressure shall be 200 psi and shall have a 2-inch threaded connection. All air and vacuum release valves shall be model ARI D-040 or approved equal. The connection to the system shall be a direct threaded connection on the top of the pipe with a saddle, with an isolation valve. If room does not allow for a direct connection, the use of a 90-degree bend can be used to offset the connection to the side. This connection must have a grade that increases as it leaves the connection at the pipe. All ARV valves must be ISO-9000 certified.

All potable water, reclaimed water, or sanitary force mains that require automatic air release only, shall have as shown on the Drawings a 1-inch threaded air release valve. This valve shall be made from light weight non-corroding fiberglass reinforced nylon plastic, with all non-metallic operating parts. The rolling resilient seal shall provide smooth positive opening, closing, and leak free sealing over the fluctuation of pressure differentials. The valve shall be designed to allow larger than normal automatic orifice providing efficient air release and minimize potential debris build up and clogging. The working pressure shall be 200 psi and tested to 350 psi. All air release valves shall be model ARI S-050 or approved equal. The connection to the system shall be a direct connection to the pipeline with the use of a saddle and an isolation valve. All ARV valves must be ISO-9000 certified.

B. Above Grade ARV

Main Line ARVs shall be isolated with a ball valve/curb stop (2 inch, and shall be Ford Brass Ball valve B11-777, larger sizes shall be approved by Seminole County). Air release valves shall be housed in WaterPlus Model ARV-H-30-B or ARV- H-40-B or approved equal; blue for water, green for sewer and purple for reclaim water.

2.08 TAPPING SLEEVES AND SADDLES

- A. Test Connection: All tapping sleeves shall be supplied with a National Pipe Thread test connection and a plug.
- B. Steel Tapping Sleeves: Sleeves shall be fabricated of minimum 3/8" carbon steel meeting ASTM A285 Grade C. Outlet 12" and above 150 psi flange shall meet AWWA C-207, Class "D". ANSI 175 psi 4" to 12" drilling and be properly recessed for the tapping valve. Bolts and nuts shall be 316 stainless steel high strength low alloy steel to AWWA C111 (ANSI A21.11). Gasket shall be vulcanized natural or synthetic rubber. Sleeve shall have manufacturer-applied, fusion-bonded epoxy coating, minimum 12 mil thickness.
- C. Stainless Steel Tapping Sleeves: Sleeve shell and lugs shall be 304 stainless steel. Bolts, washers, and nuts shall be 5/8" 304 stainless steel, NC thread and heavy hex nuts. Bolt threads shall be Teflon coated. Washers shall be plastic lubricating. Gaskets shall be virgin SER compounded for water and sewer service and shall meet ASTM D2000 MAA 410Z-90 (Z=45 Durometer). Flange shall be ductile iron or stainless steel and shall meet ASTM 536-80, Grade 65-45-12.
- D. Mechanical Joint Tapping Sleeves: Mechanical joint tapping sleeves are to be used for taps to asbestos cement pipe and size on size tap. Sleeves shall be cast of gray iron or ductile iron and have an outlet flange with the dimensions of the Class 125 flanges shown in ANSI B16.1 properly recessed for tapping valve. Glands shall be gray iron or ductile iron. Gaskets shall be vulcanized natural or synthetic rubber. Bolts and nuts shall be 316 stainless steel and comply with ANSI/AWWA C111/A21.11. Sleeves shall be capable of withstanding a 200 psi working pressure.
- E. Service Saddles: Service Saddles shall be used for 2" and smaller taps. Saddles are to be double strap and all parts are to be corrosion resistant with stainless steel straps and fasteners.

2.09 FIRE HYDRANTS

- A. Fire Hydrants shall be constructed with cast iron body compression type, opening against pressure and closing with pressure, base valve design, 150 psi working pressure, with 1/4-inch gage tapping and bronze plug in standpipe.
1. Size: Min. 5-1/4-inch valve opening and min. 6 inch inlet connection (valve).
 2. Direction to open hydrant: Left.
 3. Size and shape of operating and cap nuts: Pentagon 1½ inch point to flat.
 4. Hose Nozzles: Two 2-1/2-inch National Standard Thread, cap and chain.
 5. Pumper Nozzles: One 4-1/2-inch National Standard Thread, and cap.
 6. Depth of Trench: 5 feet 0 inches
 7. Connection to Main: 6-inch mechanical joint.
 8. Hydrant Extensions (must be of same manufacturer).
- B. Hydrants shall conform to AWWA Standard C502 latest revision and as specified herein.
- C. Hydrants shall be of the compression type, closing with line pressure.
- D. Hydrant shall be of the traffic model breakaway type.
- E. Hydrant cap and stuffing box shall be of a unitized, one piece design creating a water tight cavity without the use of gaskets. The combination of three (3) O-rings to a crimped brass ferrule around the stem shall seal the cavity from contact with water. An alemite fitting shall be supplied for periodic lubrication of the operating threads with grease.
- F. Operating nut shall be of one piece bronze construction.
- G. A dirt shield shall be provided to protect the operating mechanism from grit buildup and corrosion due to moisture.
- H. A thrust washer shall be supplied between the operating nut and stem lock nut to facilitate operation.
- I. Nozzles shall be of the tamper resistant, one-quarter turn type with O-ring seals and stainless steel retaining screws.
- J. An O-ring or rubber gasket shall be provided to seal between the upper and lower barrels.
- K. The main valve shall be of synthetic rubber.

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- L. The seat shall be of a bronze ring threaded to a bronze insert in the hydrant shoe, with O-rings to seal the drain way and barrel from leakage of water in the shoe.
- M. All fire hydrants shall be tagged with Seminole County equipment numbers. Numbering for the tags will be provided by Seminole County Water and Sewer Division.
- N. All fire hydrant interior surfaces shall be coated with a high performance, one-part, heat-curable, thermosetting epoxy coating which provides superior corrosion resistance protection for metal parts.
- O. Source Manufacturers:

1. Mueller	Part No. MA423
2. American	Part No. B84B.5 1/4" (plug drain)
3. M&H	Part No. 929 (plug drain)
4. Clow	Part No. Medallion PLGBRN
5. Kennedy	Part No. K.81A (plug drain)
- P. All fire hydrant flow tests, name plate data and GPS coordinates shall be provided to Seminole County PEI Division.
- Q. All iron parts of the hydrant both inside and outside shall be painted in accordance with AWWA C-502. All inside surfaces and the outside surfaces below the ground line shall be coated with asphalt varnish. They shall be covered with one (1) coat Dupont 131 primer, 1-1/2 mil dry film thickness and two coats, Chrome Yellow synthetic enamel 1-1/2 mil dry film thickness each coat or approved equal. The first coat shall have dried thoroughly before the second coat is applied. Fire hydrant bonnets and caps shall be painted by class, using AWWA C502 Appendix B latest edition.
- R. Hydrants shall be plumb and shall be set so that the lowest hose connection is, at least, eighteen (18) inches above the surrounding finished grade. All hydrants shall be inspected in the field upon delivery to the job to insure proper operation before installation. The resetting of existing hydrants and moving and reconnecting of existing hydrants shall be handled in a manner similar to a new installation. Hydrant shall be constructed in accordance with the Standard Drawings.

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- S. Fire hydrants shall be located in the general location as shown on the Drawings. Final field location of all hydrants shall be as approved by the COUNTY. All hydrants shall be located no less than 3 feet and no more than 8 feet from back of curb of the adjacent roadway, or 7 feet from the edge of pavement, and no less than 5 feet from any physical feature which may obstruct access or view of any hydrant unless otherwise approved by the County.

2.10 ACCESSORIES

A. Valve Boxes

All buried valves shall have cast iron three piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at or slightly above the finished grade surface as directed by the County. The barrel shall be two pieces, sliding screw type, having 5-1/4 inch shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall have "WATER" cast into the top for all water mains, "REUSE" or "RECLAIMED WATER" for reclaimed water systems, and "SEWER" for wastewater transmission systems. The actuating nuts for deeper valves shall be extended to come up to 4 foot depth below finished grade using a valve stem riser with centering ring. Care shall be taken while installing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Contractor shall remove any sand or undesirable fill from valve box prior to final inspection. All boxes shall be round. Square top boxes are not allowed.

B. Valve Installation

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the County before they are installed.

Valves shall be installed in a vertical position and be provided with a standard valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically centered over the operating nut, and the cast iron box cover shall be set flush with the road bed or finished surface.

After installation, all valves shall be subjected to the field test for piping as outlined in Section 51 of these specifications. Should any defects in materials or workmanship appear during these tests, the Contractor shall correct such defects to the satisfaction of the County.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with two (2) coats of bituminous paint.

C. Valve Pits

Provide valve pits as indicated, constructed of poured in place or precast concrete. Construct of dimensions indicated with manhole access, ladder, and drain. Provide sleeves for pipe entry and exit, provide waterproof sleeve seals.

D. Anchorages:

1. Clamps, Straps, and Washers: Steel, ASTM A 506.
2. Rods: Steel, ASTM A 575.
3. Rod Couplings: Malleable iron, ASTM A 197.
4. Bolts: Steel, ASTM A 307.
5. Cast Iron Washers: Gray iron, ASTM A 126.

E. Line Stops

Where indicated on the Drawings, line stops and/or insertion valves shall be utilized to isolate portions of water mains.

Line stops and/or insertion valves shall be completed while the water system is pressurized.

Line stops and/or insertion valves shall consist of a line stop fitting, stopping plug/valve, blind flange for installation after stop is completed, and 1-inch equalization/purge fitting.

Materials:

Line stop fitting - fabricated steel with 12 mil (minimum) epoxy coating.
Hardware and Accessories - 304 Stainless Steel Blind Flange - Ductile Iron

A concrete encasement shall be poured for pipe support at the point of line stop.

The Contractor shall be responsible for all additional pipes restraining in the vicinity of the line stop for preventing pipe movement due to any unbalanced forces created by the line stop and subsequent cutting and removal of existing pipe adjacent to any line stop.

END OF SECTION

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SECTION 02666-IDENTIFICATION AND MARKING MATERIALS

PART 1 - PRODUCTS

1.01 IDENTIFICATION AND MARKING MATERIALS

- A. Electronic marker balls and a continuous, insulated 10 gauge copper wire shall be installed on all Seminole County owned utility systems for location purposes. Marker balls shall consist of a passive device capable of reflecting a specifically designated repulse frequency tuned to the utility being installed. Balls shall be 4 inches in diameter with a high density polyethylene shell. Marker balls shall be color coded in accordance with American Public Works Association's Utility Location and Coordinating Council Standards.

Marker balls shall be 3M Markers 4-inch diameter as follows:

1. Water- Model 1423-XR/iD blue
2. Wastewater force mains-Model 1424-XR/iD green
3. Reuse-Model 1428-XR/iD purple

All pressure mains shall be installed with a continuous color-coded. Insulated 10-gauge solid core copper wire installed directly on top of the pipe.

On water, force mains, and reuse systems, electronic markers shall be furnished and installed so that a marker will be located at 100-foot intervals along the pipeline length. Markers shall also be placed at changes in direction, tees, or other points of connection and as directed by the Engineer. On gravity sewer systems, markers will only be placed at the terminal ends of the service laterals.

Marker balls shall be placed in a position directly above the pipe and hand backfilled 1 foot above the ball to prevent damage or movement during subsequent backfilling. Depth of burial shall not be less than 1-1/2 feet or more than 2 feet.

- B. The Contractor shall purchase and deliver one (1) marker ball locator to the County. Marker ball locator shall be 2250-iD/EU5W-RT as manufactured by 3M Dynatel.

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C. Pressure Pipe Identification:

1. PVC pressure pipe shall be color coded. Blue shall be used for potable water, green shall be used for pressure sewer mains, and pantone purple shall be used for reclaimed water mains. In order to preclude possible domestic water tapping, all underground ductile iron sanitary sewage force mains and reclaimed mains shall be marked with a continuous painted stripe; stripe shall be 2-inch minimum width located within the top 90 degrees of the pipe. Sanitary sewage force main shall be green and reclaimed mains shall be pantone purple.
2. During the backfilling operating, the contractor shall place a pipe-locating tape one foot directly above and parallel to the pipe run with the printed side up for visual identification. The tape shall be as manufactured by Lineguard, Inc., Wheaton, IL consisting of a 2-inch minimum width plastic and metallic foil for detection by pipeline locating equipment. Tape shall be coded as follows:

PIPE	COLOR	PRINTING
Potable Water	Blue	"Caution Buried Water Line Below"
Reuse Water	Purple	"Reclaimed Water Buried Below"
Force Main	Green	"Caution Buried Force Main Below"

D. Other Requirements:

1. Water Service: Seminole County water services will be marked with a 2" x 4" x 4' minimum wood stake or a 2" diameter x 4' minimum long PVC pipe placed vertically in ground with the top 2' painted blue located behind the meter box and a minimum marker burial depth of 2'. Additionally, 3" wide by 6" high letters will be etched or cut in the concrete curb and painted blue. Use the letter "W" for water services, "V" for valves, and "B.O." for blow offs.
2. Sewer Lateral: Seminole County sewer lateral locations will be marked by etching or cutting a 3" wide x 6" high "S" in the concrete curb and then painting it red. The terminal end of the lateral will have a 2" x 4" x 4' minimum wood stake or a 2" diameter x 4' long minimum PVC pipe placed at its invert and extending a minimum of 2' above finished grade with the top 2' painted red and a minimum marker burial depth of 2'. In addition, there will be a reusable electronic marker ball installed in accordance with the Drawings.

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3. Valve Boxes and Meter Boxes: Covers are to be marked with permanently affixed, minimum 1½" letters to identify as follows:

"WATER"	-	Potable Water
"REUSE"	-	Reclaimed Water
"SEWER"	-	Sanitary Force main

END OF SECTION

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SECTION 02675-DISINFECTION, CLEANING AND TESTING OF WATER, SANITARY AND RECLAIMED WATER MAINS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Cleaning, disinfection, biological testing, pressure testing, and television inspection of potable and reclaimed water distribution systems and wastewater collection systems.

1.02 PAYMENT

Payment for cleaning and disinfecting water mains, fittings, and appurtenances shall be incidental to the work.

Payment for construction of sample taps and laboratory testing shall be incidental to the work.

1.03 REFERENCES

AWWA C651 - Disinfecting Water Mains.

Florida Administrative Code, Chapter 10D4 - Water Systems.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 FLUSHING

All water, reclaimed water, and force mains shall be full diameter flushed to remove all sand and other foreign matter. A flushing plan is to be submitted to the Project Manager prior to flushing. The velocity of the flushing water shall be sufficient to remove all foreign material including sand. Flushing shall be terminated at the direction of the Engineer. The Contractor shall dispose of the flushing water without causing a nuisance or property damage.

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3.02 TESTING OF PRESSURE MAINS

Pressure Test: Pressure tests shall be conducted in the presence of the Engineer. The Contractor will provide a suitable pressure gauge for the test. The Contractor will provide all other necessary apparatus including a pump, flow measuring device, piping connections and fittings and the necessary labor to conduct the tests. The pressure test shall be of two hour duration. During the pressure test, the pipe being tested shall be maintained at a pressure of not less than 150 psi. During the leakage test, the piping being tested shall be maintained at the test pressure. Leakage is defined as the quantity of water added to the pipe being tested during the test period. No pipe installation will be accepted if the leakage exceeds the quantities specified in AWWA C600, Section 4.2. Visible leakage shall be corrected regardless of total leakage. The Contractor shall submit to the Engineer the testing pattern he proposes to follow prior to testing for the Engineer's approval. The test procedure shall include a means to test against all valves ensuring that each valve is watertight. Therefore, to meet this requirement, it is necessary for all new water main segments to be tested from valve to valve. Any deviation from this requirement would need to be submitted to the Engineer for prior approval.

Flushing of Completed Pipelines: Following the leakage test, each section of completed pipeline shall be as thoroughly flushed as possible. A minimum flow shall be used for flushing that will insure a velocity in the pipe of 2.5 ft. per second. Water required for testing and flushing shall be furnished by the Contractor. The water shall be from a potable water source satisfactory to the Owner.

Water for Testing and Flushing: Water required for testing and flushing shall be furnished by the Contractor. The water shall be from a potable water source satisfactory to the Owner. The cost of the water shall be included in the unit cost of the pipe and no separate payment will be made for this item.

3.03 CLEANING, DISINFECTION, STERILIZATION AND BACTERIOLOGICAL TESTING OF WATER MAINS

The Contractor shall flush all new mains and arrange for complete sterilization by chlorination to be accomplished by qualified personnel or subcontractors. Work shall conform to applicable provisions of AWWA C651 "Disinfecting Water Mains." Water with a chlorine content of 100 ppm shall be evenly distributed throughout the pipe system and allowed to remain in the pipe for 24 hours before it is flushed out. Should the

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Contractor choose a method of disinfection which requires a chlorine concentration less than 100 ppm, the Contractor shall submit a disinfection plan to the Engineer for approval prior to proceeding with the disinfection. Once the chlorinated water has been flushed from the water mains, bacteriological samples shall be collected and analyzed by an FDEP approved laboratory under the employ of the Contractor. Samples shall be taken on two consecutive days from each designated sample point. Water mains shall not be flushed between samples. If such samples do not demonstrate satisfactory results, rechlorination and additional samples at the Contractor's expense will be required. All new water service assemblies installed prior testing and disinfection shall also be disinfected.

Contractor shall construct sample taps at the locations shown on the drawings, as required by the Local Health Unit, or as designated in the FDEP water system construction permit.

Sample taps shall be left running so that samples may be collected by the approved testing laboratory as required by the Local Health Unit or FDEP.

Should samples be unsatisfactory, Contractor shall rechlorinate the water mains, reflush, and set up additional sampling with the testing laboratory until accepted by the Engineer.

3.04 FIELD QUALITY CONTROL

All tests, inspections, disinfection and record drawings shall be conducted and prepared in accordance with Seminole County Water and Sewer Standards as contained in the Land Development Code.

The County reserves the right to require main clearing and flushing activities to be performed during periods of low demand, depending upon the volume and rate of water required to perform the activities. Low demand periods typically occur between midnight and 5:30 a.m. Should the County impose this requirement on the Contractor, it shall be done at no additional cost to the County.

END OF SECTION

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SECTION 02700 - PIPE AND FITTINGS FOR RECLAIMED WATER MAIN

PART 1 - GENERAL

- 1.01 **DESCRIPTION OF WORK:** Work under this section consists of furnishing all materials, supplies, equipment and labor in accordance with the requirements set forth herein and as shown on the drawings for furnishing and installing reclaimed water pipe and appurtenances.
- 1.02 **APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:** The Work under this Contract shall be in strict accordance with the following codes and standards.
- A. Local, county and municipal codes.
 - B. American Society for Testing and Materials (ASTM).
 - C. American National Standards Institute (ANSI).
 - D. American Water Works Association (AWWA).
 - E. American Association of State Highway and Transportation Officials (AASHTO).
 - F. Florida Department of Transportation Specifications (FDOT).
 - G. Federal Specifications.
 - H. National Sanitation Foundation (NSF).
 - I. United States Department of Commerce Commercial Standards (CS).
 - J. All local government rules and regulations.
- 1.03 **SUBMITTALS**
- A. **Manufacturer's Data:** Prior to delivery, submit manufacturer's descriptive literature, catalog cut sheets, technical data and any other necessary information to show proposed products conform with the contract documents.

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- B. Shop Drawings: The Contractor shall submit shop drawings for all equipment and materials to Seminole County Environmental Services Department. Include details of pipe and fitting products, pipeline drawings, laying schedules, underground structures, connections, restraints, and anchors. At a minimum product shall meet Seminole County Water and Sewer Standards as contained in the Land Development Code.
- C. Certifications: The Contractor shall submit a certification from the pipe manufacturer that the pipe and fittings supplied have been inspected at the plant and meet these specifications and all applicable standards. All lined pipe shall be certified to be holiday free by the manufacturer's independent testing laboratory; and meets all requirements of these specifications.

1.04 MATERIALS AND EQUIPMENT

- A. Unless otherwise specified or shown on the drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.

1.05 WORKMANSHIP

- A. All materials and equipment shall be installed in accordance with the manufacturer's instructions and to these Contract Documents. The Contractor shall notify the Engineer when the manufacturer's instructions conflict with these specifications.

1.06 SITE MAINTENANCE

- A. The Contractor shall take the necessary steps to prevent objectionable blowing or drifting of dust, sand or other debris where the construction occurs in residential, commercial or other developed areas.

1.07 STORAGE OF MATERIALS AND EQUIPMENT

- A. The Contractor shall provide space for storage of materials and equipment. Pipe strung along roads and right-of-ways shall be placed in a manner that will not endanger or restrict pedestrian or vehicular traffic.

1.08 OPEN TRENCH

- A. The amount of open trench shall be limited so that no more than 100 feet of open trench in advance of the backfilling operation will remain at the end of the working day. All open trench shall be protected by the Contractor with

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barriers, warning devices and traffic control devices, which shall be kept in the correct position, properly directed and clearly visible at all times. The barrier, warning and traffic control devices shall be suitably lighted at all times that vehicular traffic lights are required.

1.09 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of water, materials and products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with water piping work similar to that required for project.
- C. Reclaimed Purveyor Compliance: Comply with requirements of Purveyor supplying reclaimed service to project, obtain required permits and inspections.

PART 2 - PRODUCTS - PRESSURE RECLAIMED MAINS

2.01 PIPE AND PIPE FITTINGS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities as indicated.
 - 1. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in potable water systems.
 - 2. Where more than one type of materials or products are indicated, selection at a minimum shall meet Seminole County's "Water & Sewer Standards" as contained in the *Land Development Code*.
- B. Pipe Fittings and Accessories: Same material and weight/class as pipes, with joining method as indicated.
- C. PVC Pipe and Fittings for Pressure Main Applications
 - 1. Polyvinyl Chloride (PVC) Pipe: All pipe shall conform to ASTM D1784 and shall be made from virgin resin compounds. Pipe 4-inches through 12-inches shall be AWWA C900, DR 18, pressure

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class 150, and meet all the requirements of the AWWA C900 standard, latest edition. Pipe 14-inches and greater shall be AWWA C905 with a dimension ratio of DR-18 or less and pressure class of 165 psi or greater, and shall meet all of the requirements of the AWWA C905 standard, latest edition. All PVC pipe 4-inches and greater shall have push-on joints using elastomeric gaskets conforming to the requirements of ASTM F477. Source Manufacturers for PVC pipe: Certainteed, Cantex, Northstar, Johns-Manville, IPEX, H&W and HEP.

All PVC pipe must bear the NSF logo for potable water use.

2. Fittings for PVC pipe 4-inches and larger: Fittings shall be mechanical joint ductile iron fittings complying with ANSI/AWWA C110/A21.10 or ANSI/AWWA C111/A21.11 with cement mortar lining and asphaltic seal coat. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111. Source manufacturers for pipe and fittings shall be: American, McWane, Star Pipe Products and U.S. Pipe.
3. Restrained Joints: The pipe restraint shall be provided by restraining sufficient length of pipe as shown on the drawings. Mechanical restraint devices for PVC pipe shall meet the following requirements listed in paragraphs a. and b. below.
 - a. Push-On Pipe Joints: Restraining devices shall consist of two split rings, restraining rods, and related hardware. The split rings shall be manufactured of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a safety factor of two and shall comply with the requirements of UNI-B-13-92. The devices shall be Series 1390 as manufactured by Uni-Flange, Romac Industries 600 Series, Star Pipe Products, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 09900, and shall be wrapped with polyethylene which meets the requirements of, and is installed in accordance with AWWA C105.

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- b. Mechanical Joint Fittings: Where PVC pipe connects to mechanical joint ductile iron fittings and joints are to be restrained, restraining device shall consist of a split ring, restraining rods, and related hardware. The split ring shall be constructed of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a factor of safety of two and shall comply with the requirements of Uni-Flange B-13-92. The devices shall be Series 1300 as manufactured by Uni-Flange, Romac Industries 600 Series, Star Pipe Products, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 00990, and shall be wrapped with polyethylene meeting the requirements of, and is installed in accordance with AWWA C105.
- c. It shall be the responsibility of the Contractor to restrain any existing pipe systems that are connected to newly constructed pipe system. Restraint shall be installed in accordance with the applicable restrained joint table detailed on the Drawings.

D. Ductile Iron Pipe and Fittings

1. Ductile Iron Pipe: Pipe shall meet ANSI/AWWA C151/A21.51 latest edition, with cement mortar lining and asphaltic seal coat complying with ANSI 21.4/AWWA C104. Pipe 4" to 12" shall have a minimum pressure Class 350 psi. Pipe 14" to 20" shall have a minimum pressure Class 250 psi. Pipe 24" and larger shall have a minimum pressure Class 200 psi. Pipes 30" and larger shall be pressure Class 150 psi. Fittings shall be push-on joint, mechanical joint, or flanged conforming to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 with cement mortar lining and asphaltic seal coat. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111. Source manufacturers for pipe and fittings shall be: American, McWane, U.S. Pipe, Griffin, Clow, and Tyler.

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2. Joints:

- a. Joints for buried ductile iron pipe shall be push-on or mechanical joints conforming to ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11 or ANSI A21.53/AWWA C153.
- b. Joints for exposed pipe above ground or in vaults shall be flanged conforming to ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11 and ANSI B16.1, 125 lb.
- c. Use restrained joints at all locations where unbalanced reactions occur. Thrust blocks are not allowed. Approved restrained joints for ductile iron pipe include factory restrained joints or mechanical restraining devices. Factory restrained joints may include Flex-Ring Joint, Lok-Ring or Fast Grip by American Cast Iron Pipe, TR-Flex or Uniflex Joints by U.S. Pipe and Foundry, or an approved equal. Mechanical restraint devices include Megalug restrainer glands by EBAA Iron for mechanical joints, Series 1300 by Uni-Flange for mechanical joints, Series 1390 by Uni-Flange for push-on joints, Star Pipe Products series 3000, 3100 and 3600, Series 611 by Romac Industries for push-on bell and spigot joints, Series 612 by Romac Industries for mechanical joints, or an approved equal.
- d. Welded-on-Outlets: Ductile iron pipe with welded-on outlets shall be American Ductile Iron Pipe specials or an approved equal. The outlets shall be fabricated from centrifugally cast ductile iron pipe, manufactured and tested in accordance with ANSI/AWWA C151/A21.51. The welded-on pipe outlet shall be assembled to the parent pipe at the pipe factory. No field welded-on outlets will be accepted. Outlets shall have a rated working pressure of 250 psi and shall have a cement mortar lining in accordance with ANSI/AWWA C104/A21.4. Acceptable outlet types may include flanged joints ANSI/AWWA C110/A21.10 or C115/A21.15, or mechanical joints, ANSI/AWWA C111/A21.11.
- e. It shall be the responsibility of the Contractor to restrain any existing pipe systems that are connected to newly constructed pipe systems. Restraining devices shall be installed in accordance with the applicable restrained joint table detailed on the Drawings.

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3. Exterior Coating:

a. Exposed Pipe: Exposed piping shall be furnished with a factory applied red oxide primer coat. After installation, all exposed piping shall be prepared and painted as specified under Section 09900.

b. Buried Pipe: Buried pipe shall have standard manufacturer's bituminous coating. Coating shall have a minimum thickness of 1 mil dft.

4. Interior Lining: Interior lining for ductile iron pipe shall be cement mortar lining with an asphaltic coating in accordance with ANSI/AWWA A21.4/C104.

5. Fittings: Fittings shall be push-on, mechanical joint, or flanged ductile iron fittings conforming to ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53 with cement mortar lining and asphaltic seal coat. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111. Source manufacturers for pipe and fittings shall be: American, McWane U.S. Pipe, Griffin, Clow, and Tyler.

All fittings shall have a minimum 250 psi working pressure and one of the following end connections:

a. Mechanical Joints: ANSI 21.10/AWWA C110 Table 10.1 or ANSI A21.53/AWWA C153 or ANSI/AWWA 21.11/C111.

b. Flanged Joint: ANSI/AWWA C110/A21.10, ANSI B16.1, Class 125 flanges; working pressure of 250 psi minimum.

c. Restrained Joints: All fittings shall be restrained. Restrained joint fittings may be factory restrained joints or mechanical restraining devices as described in Paragraph D.2.c above.

6. Fasteners: Provide studs, bolts, nuts and washers in quantities required to fully assemble all piping and accessories. Fasteners for flanges joints shall be AISI Type 316 stainless steel conforming to

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ASTM F 593 and ASTM F 594 for all exterior flanged piping. Fasteners for mechanical joints shall be high strength, low alloy steel having the characteristics listed in Table 6 of AWWA C111.

7. Polyethylene encasement shall conform to the requirements of ANSI/AWWA C105/A21.5.

H. Miscellaneous Fittings and Accessories:

1. Flanged Adapter: Cast iron, ASTM A126, Class B, Flanges to match ANSI B 16.1, 125 lb. flanges.
2. Wall Sleeves:
 - a. Cast iron or hot dip galvanized steel with exterior ring cast at center of sleeve.
 - b. Mechanical Joint: Acceptable Figure No. F-1436, Clow Corporation, or equal.
3. Penetration Seals: Where pipes pass through walls and sleeves, pipe-to-wall penetration closures shall be furnished.
 - a. Interlocking synthetic rubber links assemblies with austenitic stainless steel bolts and nuts.
 - b. Glass fiber reinforced plastic pressure plates under each bolt head and nut.
 - c. For Piping 10" and Larger: Links shall have reinforced centering blocks in the lower 90° quadrant or assembly.
 - d. Acceptable: Link-Seal by Thunderline Corporation, Wayne, Michigan, or equal.
4. Threaded Pipe Nipples: Short lengths unless otherwise required. Close lengths shall not be used except with special permission of the Engineer. Nipple stock shall be of same material used in connecting pipe and shall conform with material specifications.
5. D.I.P. Couplings: Couplings shall be full-circle, Rockwell, Dresser. Unless otherwise indicated, couplings 2 inches and smaller shall be malleable iron and couplings over 2 inches shall be cast iron.
6. PVC Adapters and Flexible Couplings: Prefabricated polyvinyl joint sealer adapters and couplers are manufactured by Fernco or equal, with stainless steel bands and adjusting screws.

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7. Pump-Out Connection: Connection shall be formed with fittings, plug valve and a quick disconnect coupling, as shown on the Drawings.

PART 3 - EXECUTION

- 3.01 EXCAVATION: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as necessary. This shall include all necessary clearing and grubbing of any foreign substance encountered within the structure or trench area. Excavated material suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to prevent slides or cave-ins. All applicable provisions of Section 02200, Earthwork shall be followed.
- A. Protection of Existing Facilities and Utilities: All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury and, in case of damage, they shall be restored by the Contractor without compensation. Known existing utilities and other underground obstructions are shown on the plans, but the accuracy of the locations and depths is not guaranteed. The Contractor shall contact the utility prior to construction and arrange for the necessary assistance in locating and protecting the existing utilities. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition.
 - B. Trench Excavation: The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 in. each side of pipe for unsheeted or sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus 24 in., unless otherwise shown on the drawings. Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface the trench walls shall be as vertical as possible under soil conditions.

No more than 100 linear feet of trench shall be open in advance of the completed pipe laying operation without prior approval of the Engineer. Pipe trenches across roadways and driveways shall be backfilled as soon as pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority. No trench shall be left open across any roadway or driveway for more than 24 hours.
 - C. Shoring, Sheet piling and Bracing: The Contractor shall do all shoring, sheet piling and bracing or provide other approved facilities required to perform

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and protect the excavation and as necessary for the safety of the public, the employees, and the preservation of existing roads, structures and other utilities. The top of such sheeting left in place shall be cut off at a minimum elevation of 2.5 ft below finished grade.

- D. Pavement Removal: The Contractor shall remove pavements as part of the trench excavation. The material from permanent pavement removal shall be carefully separated from trench excavation material and disposed of by the Contractor as approved by the Engineer.
- E. Boulder Removal: All rocks, stones, boulders or concrete, having any dimension larger than permitted to be used for backfill in the paragraph entitled "Backfilling" of these specifications, shall be removed from the site and disposed of by the Contractor.
- F. Disposal of Excess Materials: The Contractor shall dispose of the excavated materials not required or suitable for backfill. All surplus excavated material which is suitable for fill shall become property of the Contractor, and shall be disposed of by the Contractor at his expense.
- G. Unstable Soil Conditions and Overdepth Excavation: Where unstable soil conditions are encountered, the excavation shall be increased as directed by the Engineer. The bottom of the excavation shall be brought up to the proper excavation elevation utilizing suitable and properly compacted backfill material.

3.02 INSTALLATION OF MAINS: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturer's instructions and with the applicable AWWA or ASTM Standards. If a conflict exists between the manufacturer's instructions and the AWWA or ASTM Standards, the manufacturer's instructions shall govern.

The Contractor shall use every precaution during construction to protect the pipe against the entry of nonpotable water, dirt, wood, small animals and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless wet trench installation is approved by the Engineer.

- A. Depth of Cover: Unless otherwise shown on the drawings, or otherwise authorized by the Engineer, the pipe shall have a minimum cover of 36 inches.
- B. Connections to Existing Mains: The Contractor shall make connections to existing mains as shown on the drawings. Connections to pressurized mains shall be made only after flushing has been completed and under the system Owner's immediate supervision.

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3.03 BACKFILLING

A. Material: Shall be excavated material, essentially free of organic material, asphaltic concrete, clay, concrete, boulders and other deleterious material.

1. Bedding and Pipe Embedment: The material in the bedding, around the pipe and to a depth of 1 foot over the pipe shall be sand or a mixture of sand, shell or crushed rock properly graded and mixed so that fine grain material from the side walls of the trench or backfill above the embedment will not migrate into the backfill material. The backfill shall meet the following limitations:
 - a. Ductile Pipe - All material shall pass through a 3/4 inch square opening laboratory sieve.
 - b. Plastic Pipe - All material shall pass through a 1/2 inch square opening laboratory sieve for pressure water mains.
2. Above Pipe Embedment: The material shall be sand or a mixture of sandy material and rock, stone and shell. Rock, stone and shell shall pass through a 3-1/2 inch ring.
3. Additional Fill: If sufficient suitable backfill material is not available from the excavation, additional fill meeting the above requirements shall be provided by the Contractor at no additional expense to the Owner.

B. Placing and Compaction:

1. Pressure Mains
 - a. Under Pavement: Where the excavation is made through existing or proposed pavements, including shoulders, curbs, driveways or sidewalks, or where such structures are penetrated by wellpoints, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks passing a 3-1/2 in. ring will be permitted in the backfill between the elevation one foot above the top of the pipe and the bottom of the pavement subgrade.

The entire backfill material, including the material placed around and one foot above the pipe, shall be compacted to a density of not less than 100% of the maximum density, as determined by AASHTO T-99. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. Compaction by flooding or puddling

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will be permitted only by written authorization from the Engineer.

Roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock, or a conglomerate of such materials are not considered as being permanent pavement.

- b. In Areas Not Under Permanent Pavement: Within right-of-ways or other areas where permanent pavement does not exist or is not proposed, including roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock or conglomerate, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks having a dimension of 6 in. will be permitted in the backfill between the elevation 1 ft. above the top of the pipe and 1 ft. below the surface. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. The bedding and embedment shall be compacted to a density of not less than 100 percent of maximum as determined by AASHTO T-99. The backfill material above 1 ft. over the pipe shall be compacted to a density of not less than 98 percent of the maximum density, as determined by AASHTO T-99. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.
- c. Miscellaneous: Backfilling around meter boxes, valve boxes and other structures shall be accomplished in the same manner as the connected pipe. Extreme care shall be used in backfilling wellpoint holes should be plugged with a concrete slurry, such plugging to be at the expense of the Contractor.
- d. Compaction Tests: The Engineer may at any time instruct the Contractor to partially excavate a previously backfilled trench or temporarily backfilling of a short section of the trench for the purpose of obtaining measurements of the density of the backfill. The testing will be paid for by the Owner. The cost of the partial excavation and restoration of the backfill will be paid by the Contractor. Density tests shall be taken along the pipe. (Maximum distance between tests shall be 300 lineal feet. Tests shall begin 12" from top of pipe and shall be tested every 24" in depth for subsequent lifts).

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3.04 EXPOSED PIPING

A. General:

1. Present neat and orderly appearance with completed installation.
2. Install parallel, or at right angles, to all walls, or other building surfaces, where possible, unless indicated otherwise.
3. Space for easy removal and maintenance.

B. Vertical Piping shall be secured at sufficiently close intervals to keep pipe in alignment, and to support weight of pipe and its contents.

C. Horizontal Piping shall be supported at sufficiently close intervals to prevent sagging, and provide thrust restraint. Install supports at ends of runs or branches and at each change of direction or alignment.

D. Wall Penetrations:

1. Install wall sleeves or pipes in cast-in-place concrete walls prior to placing concrete.
2. Miscellaneous Small Piping (in lieu of wall sleeves): Provide length of galvanized steel pipe or galvanized heavy wall conduit equal to wall thickness.
3. Install specified penetration seals to provide a watertight, vermin-proof joint.

E. See Painting Section 09900 for requirements.

3.05 CULVERT REPAIR: Culverts, catch basins, swales and other drainage structures that are damaged during construction shall be replaced with materials and structures equal and similar to those removed or damaged, unless indicated otherwise. Manhole covers and gratings shall be set at the original elevations unless otherwise directed. In addition, it shall be the responsibility of the Contractor to maintain existing drainage patterns and stormwater conveyance systems throughout the duration of the project.

The Contractor shall take precautions against the entry of excavated and other loose material resulting from his operations from entering catch basins, culverts and other drainage structures in the vicinity of his operations. He shall maintain the cleanliness of these drainage structures in a condition equal to that prior to the commencement of his operations during the construction. The Contractor shall be responsible for all damage to persons, roads, buildings, vehicles and other property resulting from the failure of the Contractor to maintain these drainage structures. The cost of repair of any culverts shall be borne by the Contractor.

3.06 RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY: Where pavement, trees, shrubbery, fences or other property and surface

structures not designated as pay items, have been damaged, removed or disturbed by the Contractor whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before Work began within a time frame approved by the Engineer.

- 3.07 PROTECTION: At the end of each workday the mains under construction shall be plugged to prevent the entry of small animals or rodents. Temporary plugs shall be provided by the Contractor for this purpose.
- 3.08 CLEANUP: The Contractor shall maintain the site of the Work in a neat condition. The Contractor shall remove all excess materials, excess excavated materials and all debris resulting from his operations within a time frame approved by the Engineer.
- 3.09 PRESSURE TESTING AND FLUSHING: See Section 02675.

END OF SECTION

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SECTION 02750 - PIPE AND FITTINGS FOR SANITARY FORCE MAIN

PART 1 - GENERAL

- 1.01 **DESCRIPTION OF WORK:** Work under this Section consists of furnishing all materials, supplies, equipment and labor in accordance with the requirements set forth herein and as shown on the Drawings for furnishing and installing sanitary force main pipe and appurtenances.
- 1.02 **APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:** The Work under this Contract shall be in strict accordance with the following codes and standards.
- A. Local, county and municipal codes.
 - B. American Society for Testing and Materials (ASTM).
 - C. American National Standards Institute (ANSI).
 - D. American Water Works Association (AWWA).
 - E. American Association of State Highway and Transportation Officials (AASHTO).
 - F. Florida Department of Transportation Specifications (FDOT).
 - G. Federal Specifications.
 - H. National Sanitation Foundation (NSF).
 - I. United States Department of Commerce Commercial Standards (CS).
 - J. All local government rules and regulations.
- 1.03 **SUBMITTALS**
- A. **Manufacturer's Data:** Prior to delivery, submit manufacturer's descriptive literature, catalog cut sheets, technical data and any other necessary information to show proposed products conform with the contract documents.
 - B. **Shop Drawings:** The Contractor shall submit shop drawings for all equipment and materials to Seminole County Environmental Services Department. Include details of pipe and fitting products, pipeline drawings, laying schedules, underground structures, connections, restraints, and anchors. At a minimum product shall meet Seminole County Water and Sewer Standards as contained in the Land Development Code.

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- C Certifications: The Contractor shall submit a certification from the pipe manufacturer that the pipe and fittings supplied have been inspected at the plant and meet these specifications and all applicable standards. All lined pipe shall be certified to be holiday free by the manufacturer's independent testing laboratory; and meets all requirements of these specifications.

1.04 MATERIALS AND EQUIPMENT

- A. Unless otherwise specified or shown on the Drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.

1.05 WORKMANSHIP

- A. All materials and equipment shall be installed in accordance with the manufacturer's instructions and to these Contract Documents. The Contractor shall notify the Engineer when the manufacturer's instructions conflict with these specifications.

1.06 SITE MAINTENANCE

- A. The Contractor shall take the necessary steps to prevent objectionable blowing or drifting of dust, sand or other debris where the construction occurs in residential, commercial or other developed areas.

1.07 STORAGE OF MATERIALS AND EQUIPMENT

- A. The Contractor shall provide space for storage of materials and equipment. Pipe strung along roads and right-of-ways shall be placed in a manner that will not endanger or restrict pedestrian or vehicular traffic.

1.08 OPEN TRENCH

- A. The amount of open trench shall be limited so that no more than 100 feet of open trench in advance of the backfilling operation will remain at the end of the working day. All open trench shall be protected by the Contractor with barriers, warning devices and traffic control devices, which shall be kept in the correct position, properly directed and clearly visible at all times. The barrier, warning and traffic control devices shall be suitably lighted at all times that vehicular traffic lights are required.

1.09 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of water, materials and products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

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- B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with water piping work similar to that required for project.

PART 2 - PRODUCTS

2.01 PIPE AND PIPE FITTINGS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities as indicated.
1. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in potable water systems.
 2. Where more than one type of materials or products are indicated, selection at a minimum shall meet Seminole County's "Water & Sewer Standards" as contained in the *Land Development Code*.
- B. Pipe Fittings and Accessories: Same material and weight/class as pipes, with joining method as indicated.
- C. PVC Pipe and Fittings for Pressure Main Applications
1. Polyvinyl Chloride (PVC) Pipe: All pipe shall conform to ASTM D1784 and shall be made from virgin resin compounds. Pipe 4 inches through 12 inches shall be DR 18, pressure class 150, and meet all the requirements of the AWWA C900 standard, latest edition. All PVC pipe 4-inches and greater shall have push-on joints using elastomeric gaskets conforming to the requirements of ASTM F477. Source Manufacturers for PVC pipe: Certainteed, Cantex, Northstar, Johns-Manville, IPEX, H&W and HEP.
 2. Fittings for PVC pipe 4 inches and larger: Fittings shall be injection-molded PVC pressure fittings complying with AWWA C907-04. Gaskets for push-on or mechanical joints shall be vulcanized styrene butadiene rubber. Tee-bolts and nuts for mechanical joints shall be high strength low-alloy steel having the characteristics listed in Table 6 of AWWA C111.
 3. Restrained Joints: The pipe restraint shall be provided by restraining sufficient length of pipe as shown on the Drawings. Mechanical restraint devices for PVC pipe shall meet the following requirements listed in paragraphs a. and b. below.
 - a. Push-On Pipe Joints: Restraining devices shall consist of two split rings, restraining rods, and related hardware. The split

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rings shall be manufactured of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a safety factor of two and shall comply with the requirements of UNI-B-13-92. The devices shall be Series 1390 as manufactured by Uni-Flange, Romac Industries 600 Series, Star Pipe Products, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 09900, and shall be wrapped with polyethylene which meets the requirements of, and is installed in accordance with AWWA C105.

- b. Mechanical Joint Fittings: Where PVC pipe connects to mechanical joint ductile iron fittings and joints are to be restrained, restraining device shall consist of a split ring, restraining rods, and related hardware. The split ring shall be constructed of high strength ductile iron meeting the requirements of ASTM A536, Grade 65-45-12, or structural steel meeting the requirements of ASTM A36. Restraining rods, bolts, and connecting hardware shall be in accordance with ANSI/AWWA C111/A21.11. The devices shall be rated for a working pressure of at least 200 psi with a factor of safety of two and shall comply with the requirements of Uni-Flange B-13-92. The devices shall be Series 1300 as manufactured by Uni-Flange, Romac Industries 600 Series, Star Pipe Products, One Bolt or an approved equal. After installation, restraining assemblies which are not ductile iron shall be painted in accordance with Paragraph 2.02, B., 11., Section 09900, and shall be wrapped with polyethylene meeting the requirements of, and is installed in accordance with AWWA C105.
 - c. It shall be the responsibility of the Contractor to restrain any existing pipe systems that are connected to newly constructed pipe system. Restraint shall be installed in accordance with the applicable restrained joint table detailed on the Drawings.
4. Fasteners: Provide studs, bolts, nuts and washers in quantities required to fully assemble all piping and accessories. Fasteners for flanges joints shall be AISI Type 316 stainless steel conforming to ASTM F 593 and ASTM F 594 for all exterior flanged piping. Fasteners for mechanical joints shall be high strength, low alloy steel having the characteristics listed in Table 6 of AWWA C111.

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PART 3 - EXECUTION

3.01 EXCAVATION: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the Drawings or as necessary. This shall include all necessary clearing and grubbing of any foreign substance encountered within the structure or trench area. Excavated material suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to prevent slides or cave-ins. All applicable provisions of Section 02200, Earthwork shall be followed.

- A. Protection of Existing Facilities and Utilities: All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury and, in case of damage, they shall be restored by the Contractor without compensation. Known existing utilities and other underground obstructions are shown on the plans, but the accuracy of the locations and depths is not guaranteed. The Contractor shall contact the utility prior to construction and arrange for the necessary assistance in locating and protecting the existing utilities. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition.
- B. Trench Excavation: The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 in. each side of pipe for unsheeted or sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus 24 in., unless otherwise shown on the Drawings. Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface the trench walls shall be as vertical as possible under soil conditions.

No more than 100 linear feet of trench shall be open in advance of the completed pipe laying operation without prior approval of the Engineer. Pipe trenches across roadways and driveways shall be backfilled as soon as pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority. No trench shall be left open across any roadway or driveway for more than 24 hours.

- C. Shoring, Sheet piling and Bracing: The Contractor shall do all shoring, sheet piling and bracing or provide other approved facilities required to perform and protect the excavation and as necessary for the safety of the public, the employees, and the preservation of existing roads, structures and other utilities. The top of such sheet piling left in place shall be cut off at a minimum elevation of 2.5 ft below finished grade.

- D. **Pavement Removal:** The Contractor shall remove pavements as part of the trench excavation. The material from permanent pavement removal shall be carefully separated from trench excavation material and disposed of by the Contractor as approved by the Engineer.
- E. **Boulder Removal:** All rocks, stones, boulders or concrete, having any dimension larger than permitted to be used for backfill in the paragraph entitled "Backfilling" of these specifications, shall be removed from the site and disposed of by the Contractor.
- F. **Disposal of Excess Materials:** The Contractor shall dispose of the excavated materials not required or suitable for backfill. All surplus excavated material which is suitable for fill shall become property of the Contractor, and shall be disposed of by the Contractor at his expense.
- G. **Unstable Soil Conditions and Overdepth Excavation:** Where unstable soil conditions are encountered, the excavation shall be increased as directed by the Engineer. The bottom of the excavation shall be brought up to the proper excavation elevation utilizing suitable and properly compacted backfill material.

3.02 INSTALLATION OF MAINS: Unless otherwise noted on the Drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturer's instructions and with the applicable AWWA or ASTM Standards. If a conflict exists between the manufacturer's instructions and the AWWA or ASTM Standards, the manufacturer's instructions shall govern.

The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless wet trench installation is approved by the Engineer.

- A. **Depth of Cover:** Unless otherwise shown on the Drawings, or otherwise authorized by the Engineer, the pipe shall have a minimum cover of 36 inches.
- B. **Connections to Existing Mains:** The Contractor shall make connections to existing mains as shown on the Drawings. Connections to pressurized mains shall be made only after flushing has been completed and under the system Owner's immediate supervision.

3.03 BACKFILLING

A. Material: Shall be excavated material, essentially free of organic material, asphaltic concrete, clay, concrete, boulders and other deleterious material.

1. Bedding and Pipe Embedment: The material in the bedding, around the pipe and to a depth of 1 foot over the pipe shall be sand or a mixture of sand, shell or crushed rock properly graded and mixed so that fine grain material from the side walls of the trench or backfill above the embedment will not migrate into the backfill material. The backfill shall meet the following limitations:

a. Plastic Pipe - All material shall pass through a 1/2-inch square opening laboratory sieve for pressure mains.

2. Above Pipe Embedment: The material shall be sand or a mixture of sandy material and rock, stone and shell. Rock, stone and shell shall pass through a 3-1/2 inch ring.

3. Additional Fill: If sufficient suitable backfill material is not available from the excavation, additional fill meeting the above requirements shall be provided by the Contractor at no additional expense to the Owner.

B. Placing and Compaction:

1. Pressure Mains

a. Under Pavement: Where the excavation is made through existing or proposed pavements, including shoulders, curbs, driveways or sidewalks, or where such structures are penetrated by wellpoints, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks passing a 3-1/2 in. ring will be permitted in the backfill between the elevation one foot above the top of the pipe and the bottom of the pavement subgrade.

The entire backfill material, including the material placed around and one foot above the pipe, shall be compacted to a density of not less than 100% of the maximum density, as determined by AASHTO T-99. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.

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Roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock, or a conglomerate of such materials are not considered as being permanent pavement.

- b. In Areas Not Under Permanent Pavement: Within right-of-ways or other areas where permanent pavement does not exist or is not proposed, including roads, walks and driveways consisting of broken stone, gravel, marl, shell, shellrock or conglomerate, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks having a dimension of 6 in. will be permitted in the backfill between the elevation 1 ft. above the top of the pipe and 1 ft. below the surface. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. The bedding and embedment shall be compacted to a density of not less than 100 percent of maximum as determined by AASHTO T-99. The backfill material above 1 ft. over the pipe shall be compacted to a density of not less than 98 percent of the maximum density, as determined by AASHTO T-99. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.
- c. Miscellaneous: Backfilling around meter boxes, valve boxes and other structures shall be accomplished in the same manner as the connected pipe. Extreme care shall be used in backfilling wellpoint holes should be plugged with a concrete slurry, such plugging to be at the expense of the Contractor.
- d. Compaction Tests: The Engineer may at any time instruct the Contractor to partially excavate a previously backfilled trench or temporarily backfilling of a short section of the trench for the purpose of obtaining measurements of the density of the backfill. The testing will be paid for by the Owner. The cost of the partial excavation and restoration of the backfill will be paid by the Contractor. Density tests shall be taken along the pipe. (Maximum distance between tests shall be 300 lineal feet. Tests shall begin 12" from top of pipe and shall be tested every 24" in depth for subsequent lifts).

- 3.04 **CULVERT REPAIR:** Culverts, catch basins, swales and other drainage structures that are damaged during construction shall be replaced with materials and structures equal and similar to those removed or damaged, unless indicated otherwise. Manhole covers and gratings shall be set at the original elevations unless otherwise directed. In addition, it shall be the responsibility of the Contractor to maintain existing drainage patterns and stormwater conveyance systems throughout the duration of the project.

The Contractor shall take precautions against the entry of excavated and other loose material resulting from his operations from entering catch basins, culverts and other drainage structures in the vicinity of his operations. He shall maintain the cleanliness of these drainage structures in a condition equal to that prior to the commencement of his operations during the construction. The Contractor shall be responsible for all damage to persons, roads, buildings, vehicles and other property resulting from the failure of the Contractor to maintain these drainage structures. The cost of repair of any culverts shall be borne by the Contractor.

- 3.05 **RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY:** Where pavement, trees, shrubbery, fences or other property and surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before Work began within a time frame approved by the Engineer.
- 3.06 **PROTECTION:** At the end of each workday the mains under construction shall be plugged to prevent the entry of small animals or rodents. Temporary plugs shall be provided by the Contractor for this purpose.
- 3.07 **CLEANUP:** The Contractor shall maintain the site of the Work in a neat condition. The Contractor shall remove all excess materials, excess excavated materials and all debris resulting from his operations within a time frame approved by the Engineer.
- 3.09 **PRESSURE TESTING:** See Section 02675 for requirements.

END OF SECTION

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SECTION 02930 - SODDING

PART 1 - GENERAL

1.01 DESCRIPTION: The Contractor shall furnish all materials and labor necessary for construction. It is the intent of this specification that damaged areas are to be replaced in kind, with sod to be used for all maintained yard areas.

1.02 STORAGE OF MATERIALS: The Contractor shall provide space for storage of sod prior to placement in a manner that will not endanger or restrict pedestrian or vehicular traffic or interfere with other aspects of the work.

1.03 All disturbed areas having slopes in excess of 3:1, located in a drainage ditch or located within existing landscaped areas with turf grass shall be restored with solid sodding.

PART 2 - PRODUCTS

2.01 SOD: Sodding shall be in accordance with section 575-1 through 575-2 of the DOT Specifications. Sod being replaced in existing sodded areas shall be replaced in kind. Sod in new areas shall be St. Augustine Floratam. Sod in existing areas shall match existing sod type, as approved by the Engineer.

PART 3 - EXECUTION

3.01 SOD: Sodding shall be in accordance with Section 575-3 of the DOT Specifications.

3.02 MAINTENANCE: Sodding shall be maintained in accordance with Section 575-3.4 of the DOT Specifications.

3.03 SPRINKLER SYSTEM: Where sprinkler/irrigation systems require repair or replacement, the Contractor's sodding operation shall not commence until the Engineer has approved the repaired or replaced system.

END OF SECTION

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent of painting work is shown on the drawings and schedules, and as specified.
- B. The work includes painting and finishing of interior and exterior exposed items and surfaces throughout the project, except as otherwise indicated. The term "painting" includes furnishing all material, tools, and labor required to provide a completed project. Surface preparation, priming, and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of the work. Unless otherwise indicated paint all exposed galvanized surfaces and items.
- C. "Paint" as used means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- D. Paint all exposed surfaces whether or not colors are designated in "schedules", except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas. If color or finish is not designated, the Engineer will select these from standard colors available for the materials systems specified.

1.02 REFERENCE STANDARDS: The work shall conform to applicable provisions of the following standards, except as modified herein.

- A. American National Standards Institute (ANSI):
 - ANSI/EIA RS-359-1969 Colors for Identification and Coding (ANSI C83.1).
 - ANSI Z53.1-1979 Safety Color Code and Marking Physical Hazards.
 - ANSI A13.1-1975 Scheme for the Identification of Piping Systems.

B. American Society for Testing and Materials (ASTM):

ASTM D 2200-67(1980)	Pictorial Surface Preparation Standards for Painting Steel Structures.
ASTM D 3276-80	Recommended Guide for Paint Inspectors.

C. Steel Structures Painting Council (SSPC):

SSPC-SP 1-63	Surface Preparation Specification, No. 1 Solvent Cleaning.
SSPC-SP 2-63	Surface Preparation Specification No. 2 Hand Tool Cleaning.
SSPC-SP 3-63	Surface Preparation Specification, No. 3 Power Tool Cleaning.
SSPC-SP 6-63	Surface Preparation Specification, N. 6 Commercial Blast Cleaning.
SSPC-SP 7-63	Surface Preparation Specification, No. 7 Brush-off Blast.
SSPC-SP 10-63T	Surface Preparation Specification, No. 10 Near White Metal Blast.
SSPC-PA 1-64	Paint Application Specifications, No. 1 Shop, Field and Maintenance Painting.
SSPC-PA 2-73T	Paint Application Specifications, No. 2 Measurement of Dry Paint Thickness with Magnetic Gauges.

1.03 PAINTING NOT INCLUDED

A. The following categories of work are not included as part of the field-applied finish work, or are included in other sections of the specifications.

1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for miscellaneous metal and similar items. Also, for fabricated components such as

- shop fabricated or factory-built mechanical and electrical equipment or accessories.
2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing is specified for such items as (but not limited to) finished mechanical and electrical equipment.
 3. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require finish painting, unless otherwise indicated.
 4. Operating Parts and Labels:
 - a. Moving parts of operating units, mechanical and electrical parts, such as valve operators, linkages, sensing devices, will not require finish painting, unless otherwise indicated.
 - b. Do not paint over any code-required labels, Such as Underwriters Laboratories and Factory Manual, or any equipment identification, performance rating, name or nomenclature plates.

1.04 SUBMITTALS

- A. Manufacturer's Data; Painting: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples; Painting: Submit samples to Engineer for review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the material and application for each coat of each finish sample.

1.05 DELIVERY AND STORAGE

- A. Deliver all materials to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label and the following information:
 1. Name or title or material.
 2. Manufacturer's stock number and date of manufacture.
 3. Manufacturer's name.
 4. Contents by volume for major pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.

1.06 JOB CONDITIONS

- A. Apply waterbase paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F and 90 degrees F unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F and 95 degrees F unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and maintained within the temperature and humidity limits specified by the paint manufacturer during application and drying periods.

1.07 PAINTED ITEMS SCHEDULE: In general, all existing building interiors, and new structures and related equipment, shall have the interiors and exteriors cleaned and painted, including those scheduled below:

- A. Piping and valves.
- B. Concrete vault.
- C. Concrete slab over wet well (exposed interior side only).
- D. Potable water backflow prevention devices.

PART 2 - PRODUCTS

2.01 COLORS AND FINISHES:

- A. Paint colors, surface treatments, and finishes shall be as follows or selected from Manufacturer's sample chips.
 - 1. Owner shall decide on all other colors and treatments.
- B. Final acceptance of finishes will be from samples applied on the job.

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- C. Color Pigments: Pure, nonfading, applicable types to suite the substrates and service indicated.
- D. Paint Coordination: Provide finish coats which are compatible with prime paints used regardless of whether prime coats are field or shop applied. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coating system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use to ensure compatible prime coats used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Engineer in writing of any anticipated problems using specified coating systems with substrate primed by others.
- E. Potable water backflow prevention devices shall be color-coded in accordance with the Seminole County *Land Development Code* (latest version).

2.02 MATERIAL QUALITY

- A. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best-grade product will not be acceptable. Acceptable manufacturers include:
 - 1. Glidden Coatings and Resins, Division of SCM Corporation.
 - 2. Carboline
 - 3. Porter International.
 - 4. Indurall Coatings, Inc.
- B. Proprietary names used to designate materials are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers. All proposed coatings shall be approved by the Engineer prior to use.
- C. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.03 PAINTING SYSTEMS SCHEDULE

A. The following painting systems shall be utilized for the specified items to be painted at the specified locations:

1. Piping/Valves:
 - a. Above grade, exterior:
 - 1) Surface preparation: SSPC-6, commercial blast.
 - 2) Primer: One coat, magna prime epoxy primer, 5 mils D.F.T.
 - 3) Finish Coat: Two coats, Hythane, 2 mils D.F.T. per coat.
 - b. Below grade, exterior (wetwell and vault):
 - 1) Surface preparation: SSPC-SP10, near white metal blast.
 - 2) Primer: One coat, Tarsel, coal tar epoxy, 8 mils, D.F.T. per coat.
 - 3) Finish: One coat, Tarsel, coal tar epoxy, 8 mils D.F.T. per coat.
2. Concrete Vault:
 - a. Interior/Exterior:
 - 1) Surface preparation: Sweep blast.
 - 2) Primer: One coat, Tarsel Maxi-Build, coal tar epoxy, thinned 20%, 4 mils D.F.T., or equal.
 - 3) Finish Coat: One coat, Tarsel Maxi-Build, 16 mils D.F.T., or equal.
3. Concrete Slab over Wet Well (Interior only)
 - a. Surface preparation: Sweep blast.
 - b. Finish Coat: Sauereisen No. 210, or equal, 1/8" min. D.F.T.

PART 3 - EXECUTION

3.01 INSPECTION: Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3.02 SURFACE PREPARATION

- A. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as specified, for each particular substrate condition.

1. Remove all hardware, hardware accessories, machined surfaces, plates, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items.
2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

B. Cementitious Materials:

1. Prepare cementitious surfaces of concrete to be painted by removing all efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze. Concrete shall be patched as required prior to start of painting.
2. Determine the alkalinity and moisture content of the surfaces to be painted by performing appropriate tests. If the surfaces are found to be sufficiently alkaline to cause blistering and burning of the finish paint, the condition shall be corrected before application of paint. Do not paint over surfaces where the moisture content exceeds that permitted in the manufacturer's painted directions. Concrete shall properly cure for 60 days minimum and concrete masonry and cement plaster shall cure for 30 days minimum prior to start of painting.

C. Ferrous Metals, Nongalvanized Surfaces:

1. Clean ferrous surfaces which are not galvanized or shop-coated, of surface contaminants such as oil, grease, dirt, weld splatters, burrs, loose mill scale and other foreign substances by solvent or mechanical cleaning.

D. Ferrous Metals, Galvanized Surfaces:

1. Clean free of oil and other surface contaminants with an acceptable nonpetroleum based solvent. Touch up surfaces with galvanized touch-up paint as required.

E. Ferrous Metals, Shop Primed:

1. Clean up oil, grease and remove rust, scaling paint. Reprime damaged and abraded areas.

3.03 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir or mix materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.

3.04 APPLICATION

A. General:

1. Apply paint in accordance with the manufacturer's directions. Use applicators and techniques best suited for the substrate and type of material being applied.
2. Apply additional coats when undercoats or other conditions show through the final coat of paint, until the paint film is of uniform finish, color, and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
3. Paint surfaces behind moveable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
4. Paint the back sides of access panels, and removable or hinged louvers to match the exposed surfaces.
5. Finish exterior doors on tops, bottoms, and side edges the same as the exterior faces, unless otherwise indicated.
6. Sand lightly between each succeeding enamel coat.
7. Omit the first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

5/9/06

09900 - 8

B. Scheduling Painting:

1. Apply the first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
2. Allow sufficient times between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Field Quality Control:

1. Testing: As coating and painting progresses, the applicator shall check wet film with a wet film gauge to check thickness required to get dry film thickness. After the paint and coating have dried and properly cured, the measurement of dry paint thickness shall be by method approved by Engineer and paint manufacturer at prepainting conference. Make five separate spot measurements in each space for each surface such as walls, floor and ceilings. Record location and test results.
2. Coating Cans: Empty coating cans shall be capped and neatly stacked in an area designated by the Engineer. They shall be removed from the project site only after the Contractor has provided the Engineer a notarized statement that details the materials and quantities used in the project.

D. Completed Work: Match approved samples for color, texture, and coverage. Remove paint refinish or repair work not in compliance with specified requirements.

3.05 CLEAN-UP AND PROTECTION

- A. Clean-up: During the process of the work, remove from the site all discarded paint materials, rubbish, cans, and rags at the end of each work day.
1. Upon completion of painting work, clean paint- spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
 2. Concrete slab area shall be protected from splattered paint.

5/9/06

09900 - 9

- B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing, or replacing, and repainting, as acceptable to the Engineer.
- C. Provide "Wet-Paint" signs as required to protect newly- painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- D. Touch-Up: At the completion of other trades, touch-up and restore all damage or deface painted surfaces.

END OF SECTION

5/9/06

09900 - 10

EXHIBIT (B)

BID FORM

SEMINOLE COUNTY, FLORIDA
FOR THE CONSTRUCTION OF

PROJECT: Markham Woods Road Utilities Phase II
COUNTY CONTRACT NO. CC-2059-07/LKR

Name of Bidder: Expertech Network Installation Inc.
Mailing Address: 6781 W. Sunrise
Street Address: 6781 W. Sunrise
City/State/Zip: Plantation, FL 33313
Phone Number: (954) 797-4364
FAX Number: (954) 797-6851
Contractor License Number: CC1224319

TO: Purchasing and Contacts Division of Seminole County, Florida

Pursuant to and in compliance with your notice inviting sealed Bids (Invitation for Bid), Instructions to Bidders, and the other documents relating thereto, the undersigned Bidder, having familiarized himself with the terms of the Contract Documents, local conditions affecting the performance of the Work, and the cost of the Work at the place where the Work is to be done, hereby proposes and agrees to perform within the time stipulated in the Contract Documents, including all of its component parts and everything required to be performed, and to provide and furnish any and all of the labor, Material, and tools, expendable Equipment, and all utility and transportation services necessary to perform the Work and complete in a workmanlike manner, all of the Work required in connection with the construction of said Work all in strict conformity with the Plans and Specifications and other Contract Documents, including Addenda Nos. 2 through 7, on file at the Purchasing Division for the Total Bid (Contract Price) hereinafter set forth.

The undersigned Bidder agrees that the Work shall be completed according to the schedule set forth in the Contract Documents.

The undersigned Bidder further agrees to pay liquidated damages as described in the Contract Documents.

Bid prices must be stated in words in accordance with these Instructions to Bidders in the blank space(s) provided for that purpose.

Bidder acknowledges that it has read and fully understands all Sections of the Instructions To Bidders.

BID FORM
4/2007

Markham Woods Road Utilities Phase II

00100-1
CC-2059-07/LKR

The undersigned, as Bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any person, firm or corporation; and he proposes and agrees, if the proposal is accepted, that he will execute an Agreement with the COUNTY in the form set forth in the Contract Documents; that he will furnish the Contract Security, Insurance Certificates, Endorsements, and Policies, that he is aware that failure to properly comply with the requirements set out in the "Instructions to Bidders" and elsewhere in the Contract Documents may result in a finding that the Bidder is non-responsive and may cause a forfeiture of the Bid Security.

Attention: Bids shall only be considered from those Bidders who have obtained these Contract Documents from the COUNTY directly or via the website (www.seminolecountyfl.gov/purchasing).

BID FORM

Pursuant to and in compliance with your Invitation for Bid, the Instructions to Bidders, and other documents relating thereto, the undersigned hereby agrees to furnish all labor, Materials and Equipment to do the Work in strict accordance with the Contract Documents and all addenda, if any, issued prior to the date of this Bid at the Total Bid herein as follows:

TOTAL AMOUNT OF BID: 3,910,167.70
Numbers

Three million, nine hundred and ten thousand, One hundred and sixty seven dollars and seventy cents.
(IN WORDS)

1. The Bidder acknowledges that the Total Amount of Bid stated above includes the sum of \$250.00 or 1% of the Bid whichever is greater, specific consideration for indemnification.
2. The Bidder acknowledges that the Total Amount of Bid stated above includes compensation for all Work, labor, permits, bonds, equipment, materials, and any and all incidental costs necessary for the proper execution of the required services.

The Bidder acknowledges the receipt, execution, and return of the following forms:

Section 00100 - Bid Forms, including alternates and addendum, if any.
Section 00150 - Trench Safety Act Form
Section 00160 - Bidder Information Forms (*Including W-9*)
Section 00300 - Non-Collusion Affidavit of Bidder Form
Section 00310 - Certification of Nonsegregated Facilities Form
Section 00330 - Drug-Free Workplace Form
Section 00630 - Americans with Disabilities Act Form

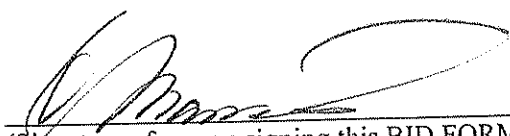
BID FORM
4/2007

Markham Woods Road Utilities Phase II

00100-2
CC-2059-07/LKR

IN WITNESS WHEREOF, BIDDER has hereunto executed this BID FORM this 24 day
of July, 2007.

Expertech Network Installation, Inc.
(Name of BIDDER)


(Signature of person signing this BID FORM)

David Marinelli
(Printed name of person signing this BID
FORM)

VP Head of US Operations
(Title of person signing this BID FORM)

ACCOMPANYING THIS BID IS Bid bond

(insert the word(s) "cashier's check," bidder's bond," certified check," or other security as provided by
law, as the case may be) in an amount equal to at least five percent (5%) of the Total Bid, payable to the

BOARD OF COUNTY COMMISSIONERS, SEMINOLE COUNTY, FLORIDA

The undersigned deposits above-named security as a Bid guarantee and agrees that it shall be
forfeited to the COUNTY as liquidated damages in case this Bid is accepted by the COUNTY and the
undersigned fails to execute an Agreement with the COUNTY as specified in the Contract Documents
accompanied by the required Payment and faithful Performance Bonds with Sureties satisfactory to the
COUNTY, and accompanied by the required certificates of insurance coverage, and endorsements.
Should the COUNTY be required to engage the services of an attorney in connection with the
enforcement of this Bid, Bidder promises to pay COUNTY's reasonable attorney's fees and costs
(including attorney's fees and costs on appeals) incurred with or without suit.

BID FORM

BID FORM
4/2007

Markham Woods Road Utilities Phase II

00100-4
CC-2059-07/LKR

BID FORM
 MARKHAM WOODS ROAD UTILITIES - PHASE II
 SEMINOLE COUNTY ENVIRONMENTAL SERVICES
 CC-2059-07/LKR

Item Number	Item Description	Quantity	Units	Unit Cost	Total
1.0	Mobilization, bonds, permits, etc. (not to exceed 5% of Total Bid Price)	1	LS	61,000.00	61,000.00
2.0	Clearing and Grubbing	87	STA	500.00	43,500.00
3.0	Maintenance of Traffic	1	LS	35,000.00	35,000.00
4.0	12-inch Water Main (push-on)	2,760	LF	33.87	93,481.20
5.0	12-inch Water Main (restrained)	3,760	LF	50.70	190,632.00
6.0	8-inch Water Main (restrained)	170	LF	29.87	5,077.90
7.0	6-inch Water Main (restrained)	65	LF	27.05	1,758.25
8.0	24-inch Reclaimed Water Main (push-on)	610	LF	104.18	63,549.80
9.0	24-inch Reclaimed Water Main (restrained)	1,510	LF	136.99	206,854.90
10.0	20-inch Reclaimed Water Main (push-on)	3,570	LF	83.31	297,416.70
11.0	20-inch Reclaimed Water Main (restrained)	6,420	LF	106.22	681,932.40
12.0	12-inch Reclaimed Water Main (restrained)	25	LF	81.01	2,025.25
13.0	8-inch Reclaimed Water Main (restrained)	75	LF	38.44	2,883.00
14.0	12-inch PVC Force Main (push-on)	8,070	LF	34.14	275,509.80
15.0	12-inch PVC Force Main (restrained)	3,970	LF	46.71	185,438.70
16.0	Remove Existing Pipe	1,488	LF	24.44	36,366.72
17.0	36-inch Steel Casing	143	LF	531.63	76,023.09
18.0	34-inch Steel Casing	575	LF	505.29	290,541.75
19.0	22-inch Steel Casing	509	LF	331.27	168,616.45
20.0	18-inch Steel Casing	70	LF	195.53	13,687.10
21.0	Ductile Iron Fittings	34	TN	5563.55	189,160.70
22.0	24-inch Horizontal Gate Valve w/ Valve Box	3	EA	18,391.87	55,175.61
23.0	20-inch Horizontal Gate Valve w/valve box	15	EA	11,350.61	170,259.15
24.0	12-inch Gate Valve w/valve box	16	EA	3,249.40	51,990.40
25.0	10-inch Gate Valve w/valve box	1	EA	2,948.59	2,948.59
26.0	8-inch Gate Valve w/valve box	14	EA	1,823.12	25,523.68
27.0	6-inch Gate Valve w/valve box	3	EA	1,260.43	3,781.29
28.0	4-inch Gate Valve w/ Valve Box	4	EA	1,065.58	4,262.32
29.0	12-inch Plug Valve w/ Valve Box	12	EA	4,453.10	53,437.20
30.0	8-inch Plug Valve w/ Valve Box	4	EA	2,868.60	11,474.40
31.0	Fire Hydrant Assembly	12	EA	2,967.16	35,605.92
32.0	Air Release/Vacuum Relief Valves (for Force Main)	7	EA	3,876.62	27,136.34
33.0	2-inch Blow-off Assembly	21	EA	454.17	9,537.57
34.0	12-inch x 12-inch Tapping Sleeve and 12-inch Tapping Valve	2	EA	7,893.98	15,787.96
35.0	12-inch x 8-inch Tapping Sleeve and 8-inch Tapping Valve	1	EA	4,897.47	4,897.47
36.0	12-inch x 6-inch Tapping Sleeve and 6-inch Tapping Valve	2	EA	4,439.16	8,878.32
37.0	8-inch x 8-inch Tapping Sleeve and 8-inch Tapping Valve	2	EA	4,629.86	9,259.72
38.0	1-1/2-inch Reclaimed Water Service Assembly	1	EA	1,116.70	1,116.70
39.0	2-inch Reclaimed Water Service Assembly	1	EA	1,339.18	1,339.18

BID FORM
MARKHAM WOODS ROAD UTILITIES - PHASE II
SEMINOLE COUNTY ENVIRONMENTAL SERVICES
CC-2059-07/LKR

Item Number	Item Description	Quantity	Units	Unit Cost	Total
40.0	1-1/2 Potable Water Service Assembly	1	EA	1,020.19	1,020.19
41.0	Fiber Optic Conduit	12,500	LF	5.47	68,375.00
42.0	Pullboxes for Fiber Optic Conduit	38	EA	934.25	35,501.50
43.0	Remove and Replace Asphalt Pavement	2,200	SY	46.74	102,828.00
44.0	Remove and Replace Concrete Driveway	65	SY	33.00	2,145.00
45.0	Remove and Replace Concrete Sidewalk	4,650	LF	15.28	71,052.00
46.0	Remove and Replace Concrete Curb	250	LF	67.21	16,802.50
47.0	Sodding	39,200	SY	2.53	99,176.00
48.0	Allowance for Trees, Shrubs, and Miscellaneous Plantings	1	LS	\$100,000	\$100,000
TOTAL BID					3,910,163.70

BID FORM
 MARKHAM WOODS ROAD UTILITIES - PHASE II
 SEMINOLE COUNTY ENVIRONMENTAL SERVICES
 CC-2059-07/LKR

Item Number	Item Description	Quantity	Units	Unit Cost	Total
Alternate Bid Item-Horizontal Directional Drill in lieu of Open Cut Installation					
A-1	8-inch HDPE (replaces 6-inch potable water main)	65	LF	195.88	12,732.20
A-2	10-inch HDPE (replaces 8-inch potable and reclaimed water main)	245	LF	129.33	31,685.85
A-3	16-inch HDPE (replaces 12-inch potable, reclaimed and force main)	18,585	LF	106.73	1,982,067.00
A-4	24-inch HDPE (replaces 20-inch reclaimed water main)	9,990	LF	195.62	1,954,243.80

Exhibit C

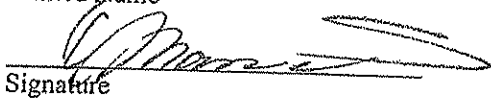
TRENCH SAFETY ACT (if applicable for this project) SECTIONS 553.60-553.64, FLORIDA STATUTES

NOTICE TO BIDDERS:

In order to comply with the Trench Safety Act, the Bidder is required to specify the costs of compliance. These costs are not a separate pay item. The Bidder must also reference the Trench Safety Standards which will be in effect during construction, and assure in writing that the Bidder will comply with the applicable Trench Safety Standards.

<u>TRENCH SAFETY MEASURE</u>	<u>UNITS OF MEASURE</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>EXTENDED COST</u>
Shoring	LF	8	187.50	1,500.00

TOTAL \$ 1,500.00

David Marinelli
Printed Name

Signature


Expertech Network Installation, Inc.
Bidder Name
7/23/07
Date

Exhibit D

AMERICANS WITH DISABILITIES ACT AFFIDAVIT

The undersigned CONTRACTOR swears that the information herein contained is true and correct and that none of the information supplied was for the purpose of defrauding COUNTY.

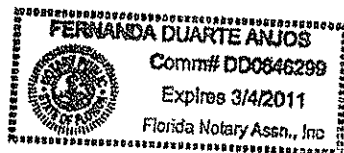
The CONTRACTOR will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The CONTRACTOR agrees to comply with the rules, regulations and relevant orders issued pursuant to the Americans with Disabilities Act (ADA), 42 USC s. 12101 *et seq.* It is understood that in no event shall the COUNTY be held liable for the actions or omissions of the CONTRACTOR or any other party or parties to the Agreement for failure to comply with the ADA. The CONTRACTOR agrees to hold harmless and indemnify the COUNTY, its agents, officers or employees from any and all claims, demands, debts, liabilities or causes of action of every kind or character, whether in law or equity, resulting from the CONTRACTOR's acts or omissions in connection with the ADA.

CONTRACTOR: Experstech Network Installation, Inc.
Signature: 
Printed Name: David Marinelli
Title: VP Head of US Operations.
Date: 7/24/07

Affix Corporate Seal

STATE OF Florida)
COUNTY OF Palm Beach) ss

The foregoing instrument was acknowledged before me this 24 day of July, 2007, by David Marinelli of Experstech Network Installation, Inc. (firm), on behalf of the firm. He/She is personally known to me or has produced _____ identification.



Fernanda D. Anjos
Print Name FERNANDA DUARTE ANJOS
Notary Public in and for the County
and State Aforementioned

My commission expires: 3/4/2011